The RUBBER AGE

VOL. 27, NO. 1 APRIL 10, 1930

LATE NEWS of the Industry

Tire Factory Output During January Totaled 4,745,149 Pneumatic Casings

TIRE manufacturers in the United States produced a total of 4,745,149 pneumatic casings during the month of January, according to estimates issued by the Rubber Manuafacturers Association, Inc., Total production of inner tubes is estimated at 4,913,880 and total production of solid cushion tires at 33,399 for the month.

This output of casings represents a marked increase from the December total of 3,261,089 units, but is still considerably below January, 1929, when 6,722,040 casings were turned out. As previously, the total production was held down by the low output of high pressure casings. Balloon tire production was higher than in any month since last August.

Shipments also gained over December, but were not quite equal to production in the case of casings. Total shipments during January are estimated as follows:

Pneumatic casings, all classes	4,700,539
Inner tubes	5,180,956
Solid and cushion tires	28,635

Inventories as of January 31 are estimated as 12,719,137 for all pneumatic casings; 13,551,023 for inner tubes, and 169,045 for solid and cushion tires.

The tire industry is estimated to have consumed a total of 56,144,195 pounds of crude rubber and 19,412,217 pounds of cotton fabric during the month of January in the manufacture of all types of pneumatic casings, inner tubes and solid and cushion tires.

The association's estimates are based on reports furnished by manufacturers who produce approximately 75 per cent of the total for the United States and have been raised in the above figures to represent 100 per cent.

Goodyear Votes Common Stock Increase; Elects Eight New Directors to Board

WHILE no changes were made among the executive officers of the Goodyear Tire & Rubber Company after the annual meeting on March 31, the stockholders at that session elected eight new directors and gave increased representation to the Cyrus S. Eaton-Otis & Company group. The shareholders also voted to increase the authorized common stock of the company from 1,450,000 shares to 5,000,000 shares.

At the organization meeting of the new Goodyear board, P. W. Litchfield was reelected president of the company and also was named chairman of the board, a position nonexistent since 1927 while the firm was under managerial control. All other executive officers were reelected and all proposals of the management were adopted by a vote of more than 91 per cent of the common stock and 77 per cent of the first preferred.

The new directors are James T. Begg, of Sandusky, O., former Representative; A. G. Partridge, managing director of the Goodyear factory at Wolverhampton, England; W. R. Burwell, president of Continental Shares, Inc.; T. M. Girdler, chairman of the board, Republic Iron & Steel Company; J. R. Nutt, chairman of the board, Union Trust Company, Cleveland, O.; H. W. O'Melveny, banker and member of the law firm of O'Melveny, Fuller & Myers, Los Angeles, Cal.; G. A. Martin, president, Sherwin-Williams Company, Cleveland, O.; and Clifford F. Stone, president, Central States Electric Company, and former vice-president of Goodyear.

Directors reelected are Robert E. Christie, Jr., of Dillon, Read & Company, New York City; Edward B. Greene, chairman of the executive committee of the Union Trust Company, Cleveland, O.; J. Arthur House, president, Guardian Trust Company, Cleveland, O.; H. B. Manton, of the Robinson Clay Products Company, Akron, O.; Grayson M.-P. Murphy, of Grayson M.-P. Murphy & Company, New York City; Robert C. Schaffner, of the A. G. Becker Company, Chicago, Ill.; Representative Francis Seiberling, of the law firm of Slabaugh, Seiberling, Huber & Guinther, Akron, O.; G. A. Tomlinson, president of the Tomlinson Fleet, Cleveland, O.; and Mr. Litchfield.

The retiring directors include Robert H. Bishop, Jr., Cleveland physician; Fayette Brown, Cleveland steel man; George B. Durrell, of the American Fork & Hoe Company; Elton Hoyt II of the Pickands Mather Company, Cleveland; Walter B. Mahony, owner of the *North American Review;* John Sherwin, of the Union Trust Company, Cleveland; and Samuel L. Smith, vice-president of the National Malleable & Steel Casting Company, Cleveland. R. L. Robinson, whose post as a director was filled, had died on September 30, 1929. Messrs. Mahony, Sherwin and Smith were also members of the executive and finance committees.

In the vote taken on a resolution to approve the actions of the board of directors from 1927 until the present time, the only dissenting vote was that of Edgar B. Davis, per-

sonal friend of Frank A. Seiberling, formerly president of Goodyear, and one of the largest individual stockholders of Goodyear common. Following the meeting, Mr. Davis refused to comment on his position in regard to the company.

Mr. Litchfield stated that no discussion of a merger with other rubber companies came before the directors' meeting and that no consolidation or merger is being contemplated. Wall Street opinion and newspaper comment, however, insisted that such plans were in view. The New York *Times*, for example, declared that "since seven of the new directors are said to be allied with the F. A. Seiberling-Cyrus Eaton-Edgar Davis group and the number of Goodyear common shares was increased threefold almost without dissent, observers here predict more confidently than ever a merger of Goodyear, Seiberling and the United States Rubber Company. That such a merger might involve the Firestone Tire & Rubber Company was hinted when it was learned that the Eaton-Otis & Company group recently came into a position of power in that company."

Du Pont Concludes Agreement to Buy Roessler & Hasslacher Chemical Co.

THE Roessler & Hasslacher Chemical Company, one of the oldest and largest chemical manufacturing organizations in the United States, has been acquired by E. I. du Pont de Nemours & Company, according to press announcements made on March 24. A special meeting of the Roessler & Hasslacher stockholders will be held in a few days for the purpose of obtaining final ratifications to the proposal.

According to du Pont officials quoted in dispatches from Wilmington, an agreement entered into calls for the acquisition of the entire assets and business of Roessler & Hasslacher, although it is the intention to continue the latter's activities without changing the name. A new company will be incorporated for the purpose of acquiring the R. & H. holdings, it was indicated, and no important changes are to be made in management or in plant operation.

The Roessler & Hasslacher Chemical Company, specializing in the manufacture of industrial chemicals, operates plants at Perth Amboy, N. J., Niagara Falls, N. Y., St. Albans, W. Va., and El Monte, Cal., and was organized in 1882 as a chemical specialty manufacturing company. Some of its products are also made by du Pont, but the acquisition will add extensively to the latter's chemical production, including some important lines of new products.

Some of the R. & H. products include chemicals for the textile and rubber industries, varnish and soap makers, the case hardening, leather and paper trades, refrigeration and water purification plants. In addition, the company specializes in the production of peroxides, pharmaceuticals, chlorinated hydrocarbons and platinum metals, as well as in two non-inflammable solvents, trichlorethylene and terachlorethane, which are used for oil extraction and degreasing, and also for solutions containing varnish, lacquer and rubber. The Roessler & Hasslacher firm has been a manufacturer of a large number of chemicals used by other chemical manufacturers, including the du Pont company, and the acquisition is expected to prove highly profitable to the latter in this respect.

Roessler & Hasslacher also conducts a large businses in Mexico through a subsidiary of the same name. The company is also financially interested in Stibium Products Company, Chloronite Company, Inc., Pacific R. & H. Chemical Corporation, Niacet Chemicals Corporation, Niagara Electric Chemical Company, Inc., Perth Amboy Chemical Works and R. & H. Platinum Works. A section of the Pacific R. & H. plant at El Monte, Cal., is used in the reclaiming of rubber.

Originally formed as a partnership by Franz Roessler and Jacob Hasslacher, the firm was incorporated in 1889. Its present assets have been estimated at upward of $15,000,000, with a surplus account of $3,000,000. The capital stock, a majority of which is held by a voting trust expiring April 30, consists of 150,000 shares of no-par common, of which 121,250 shares are outstanding, and $6,000,000 6 per cent $100 cumulative preferred, $4,850,000 of which is outstanding. W. H. Hamann is chairman of the board of directors, and H. R. Carveth is president.

Ajax Rubber Company Reports Net Loss Increased to $2,468,248 During 1929

REPORTS of the Ajax Rubber Company, Inc., and subsidiaries for the year ended December 31, 1929, shows a net loss of $2,468,248 after interest, depreciation, inventory adjustments and other charges. In the preceding year, after crediting reserves of $500,000 for rubber fluctuations set aside at the end of 1927, net loss was $2,063,970.

This marks the fourth successive year in which the company has experienced a net loss. In 1927, net loss amounted to $1,990,698 and in 1926 to $292,808. During 1925, when crude rubber and tires were at record prices, the company showed a profit of $1,005,069.

Inventory adjustments totaled $244,928, whereas the preceding year they were $312,979 in excess of the $500,000 reserve credited. The company's total loss after all expenses except interest, depreciation and inventory adjustments was $1,407,095 last year as against $559,683 in 1928.

The consolidated balance sheet of the company shows total assets as of December 31, 1929, of $9,419,825, as against the figure of $12,361,187 reported the year previous and $14,991,815 at the end of 1927. Of this total, land, buildings, machinery, etc., are represented by $2,905,407 as against $5,022,369 at the close of 1928. The 1928 figure, however, included land and buildings for housing employes, which have been eliminated from the current total, and set up as a separate asset with a value of $837,472. Cash amounted to $160,291 as compared with $886,579 at the end of 1928 and $1,278,818 at the end of 1927. Goodwill and patents are still carried at $2,184,875.

The company's capital stock and surplus account is now carried at $5,695,111 as against a figure of $9,167,826 a year ago and $10,699,495 at the close of 1927. The company's outstanding gold bonds have been reduced by $272,000, but the item of bank notes payable to the amount of $1,193,000 appears for the first time among the company's liabilities. A contingency reserve of $100,000 has been set up.

The consolidated income account for the year 1929 compares with the three preceding years as follows:

	1929	1928	1927	1926
Loss after exp., etc.	$1,534,330	$671,498	$1,305,542	*$1,045,973
Other income	127,235	111,815	137,285	159,530
Total loss	$1,407,095	$559,683	$1,168,257	*$1,205,503
Int., depr., etc.	816,225	692,614	822,441	692,872
Inv. adj., etc.	244,928	312,979	.....	805,439
Other charges	.....	†498,694	.....	.....
Net loss	$2,468,248	$2,063,970	$1,990,698	$292,808

*Profit. †Includes loss of $328,124 for mold and material obsolescense and loss of $170,570 from sale of machinery and maintenance expenses at Trenton plant.

March Rubber Consumption Figured at Over 38,000 Tons by Exchange Members

FOLLOWING reports of slightly increased operations at tire factories at Akron, O., and elsewhere, members of the Rubber Exchange of New York have made a corresponding increase in their estimates of crude consumption for the month.

Consumption of crude rubber in the United States during March is now figured to have totaled between 38,000 and 39,000 tons, compared with previous estimates ranging between 37,000 and 38,000 tons. For February the Exchange members estimated domestic consumption at 32,000 tons, and the Rubber Manufacturers Association figures later proved it to have been 32,726 tons.

A member of the exchange was informed that the Goodyear Tire & Rubber Company's plant at Akron was producing 61,000 tires daily, at the end of March, representing a slight increase over the previous week. The Racine, Wis., plant of the Ajax Rubber Company also is reported to have resumed production following a period of curtailment.

Consumption of crude rubber in March, 1929, amounted to 44,730 tons and in March, 1928, to 35,688 tons.

Members of Rubber Committee, A. S. T. M., Plan Symposium on Belting Practices

COMMITTEE D-11 on Rubber Products of the American Society for Testing Materials held a very successful meeting at Detroit, Mich., on March 18 and 19, in connnection with the Spring Group Meeting of A. S. T. M. Committees. The meeting was in charge of C. P. Boggs, vice-president of the Simplex Wire and Cable Company. W. B. Wiegand of the Binney and Smith Company was elected chairman to fill the vacancy created by the resignation of I. C. Conradi. A. W. Carpenter, the B. F. Goodrich Company, was appointed chairman of Sub-Committee X on Standard Procedures for Testing Rubber Products and F. D. Abbott, Firestone Tire and Rubber Company was appointed chairman of Sub-Committee XVII on Rubber Products for Absorbing Vibration.

The program for a symposium on rubber belting by Committee D-11, to be given at the annual meeting of the Society at Atlantic City in June, was announced. Papers on the general subjects of power transmission, stretch conditions and service life tests will be included in the symposium. The annnual meeting will be at the Chalfonte-Haddon Hall Hotel, Atlantic City, from June 23 to 27.

It was decided to offer three A. S. T. M. standard specifications for approval by the American Standards Association as follows:

Standard Specifiications for Rubber Gloves for Electrical Workers on Apparatus or Circuits Not Exceeding 3000 Volts to Ground. (D 120-23)

Standard Specifications for Rubber Matting for use Around Electrical Apparatus or Circuits Not Exceeding 300 Volts to Ground. (D178-24).

Standard Specifications for Friction Tape for General Use for Electrical Purposes. (D 69-28).

Preparation of specifications for insulated wire and cable so modified as to permit the use of organic accelarators and antioxidants was authorized. Particular emphasis was placed in discussion on the use of performance tests for the evaluation of these products instead of the usual detailed specifications.

Revision of the Standard Methods of Testing Rubber Products (D 15-24) to include insofar as practical the methods recommended in the recently proposed "Outline of Procedure for Preparation and Testing of Rubber Samples" recommended by the Physical Testing Committee of the Rubber Section, American Chemical Society, was authorized.

The present Tentative Methods of Chemical Analysis of Rubber Products (D 297-29 T) are to be revised in so far as they are affected by the presence of organic accelerators and antioxidants.

An extensive test program designed to work out a standard method for testing flow under compression of rubber products used to absorb vibration is in progress. Preliminary data was presented and provided much interest and considerable discussion.

Control of Murray Rubber Company Is Shifted Into Hands of Bankers

C. EDWARD MURRAY, JR., president of the Murray Rubber Company, Trenton, N. J., has resigned and the concern is now in the hands of a new directorate. His decision was made effective at once, but while severing his official connection with the company that bears his family's name, he still retains a large stock interest in the firm. Mr. Murray has made no plans for the future. J. Cornell Murray, brother of the former president, also handed in his resignation as a director of the firm. General C. Edward Murray, Sr., severed his connection with the company some time ago, and there is now no member of the family connected with the company.

The rubber company met financial reverses several years ago when Sears, Roebuck & Company cancelled a large tire contract. At that time several investment and commercial banking institutions bought substantial stock holdings in the Murray company. Principal among those purchasers was Caldwell & Company, of Nashville, Tenn. The Caldwell firm now has a large majority in the company's board of directors. Production at the plant has been under supervision of the Caldwell company for the past year and has increased until at present the factory is running to full capacity with three shifts working 24 hours a day. The company has opened up a string of 1,500 tire selling chain stores in 36 states.

At the reorganization of the directing board, the following men were named to the directorate: J. D. Carter, E. J. Heitzberg, L. B. Stevens, T. G. Donovan, W. S. Walker, Albert H. Branham, representing the Caldwell company; Charles F. Jones, representing the National Bank of Kentucky, of Louisville; B. B. Hicks, representing the Third National Bank and Trust Company, of Scranton, Pa., of which he is vice-president. Mr. Branham has been in charge of affairs at the Murray plant for the Caldwell firm for the past year and is vice-president of the Murray Company. He will continue in that capacity. A new president, ssucceeding Mr. Murray, has not yet been selected. Five hundred men are now employed at the plant with sixty working in the offices.

Mr. Branham says the company expects to have 2,500 chain stores in operation by the end of this year. He says the company produced and sold more than 40,000 tires during the month of March.

Until a few months ago, the Murray Rubber Company was also a large manufacturer of mechanical goods, but this department has been indefinitely discontinued to permit concentration on the tire line and the development of chain tire stores. Some of the miscellaneous products formerly produced at the Murray plants are now being manufactured for the company by another Trenton concern. Other lines, on which there had been but a small profit, have been entirely discontinued.

(Other news of the industry will be found on Pages 35-41)

Main Factory of the Dunlop Rubber Company at Fort Dunlop, England

A Review of the Tire Industry

Expansion of Older Establishments by Michelin—United States Gains —Tire Production Increases

By HARRY W. NEWMAN

THE year 1929 witnessed many new developments within the European tire industry and trade. Consumption increased in nearly every country, production was greater at most of the factories, and exports heavier. The keen competition which has characterized the industry for some time was even more intensified during 1929, but the most significant features were the expansion of the principal establishments and the strengthening of the industry in many of the smaller nations.

Prices were raised and lowered in order to gain on the other fellow. Discounts and rebates were changed to such an extent that very little profit was left for the dealer. In some countries associations have been formed for mutual benefit of all concerned, but in most instances the associations lacked the power to enforce the regulations and as a consequence confidential discounts were given, contrary to the written agreements, in order to consummate sales.

Michelin Is Leading Organization

At the head of the European tire industry stands A. Michelin & Cie., with headquarters at Clermont-Ferrand, France, and with subsidiary plants in Italy, Great Britain, and the United States. It is the most important manufacturer of casings and tubes in Europe and the most formidible competitor of the United States and other nations in all foreign markets. Michelin was the first to plan an expansion program and immediately the other large companies began "to sit up and take notice."

Early in 1929 Michelin representatives visited South America and purchased sites at Sao Paulo, Brazil, and Buenos Aires, Argentina, with the ultimate intentions of erecting factories for the manufacture of tires. Instantly, Goodyear and Goodrich bought sites in order to combat the activities of the Michelin organization in that area.

After negotiations were completed in South America, Michelin advertised for available factory sites in Germany. Before the close of 1929 a factory site of 140,000 square meters was purchased in Karlsruhe where plans were formulated to begin building operations before the spring of 1930. The factory will require the help of about 1,000 workers. This step was of considerable importance to the tire trade, for Michelin at one time held an important position upon the German market, but recently United States and German competition has been largely responsible for keeping Michelin sales at a low level, until it was estimated that Michelin participation on the German market during 1929 was scarcely more than 3 per cent.

Incidentally, the American press announced that Michelin would join the group of manufacturers in the vicinity of Los Angeles to take care of the growing western trade of its New Jersey plant, and perhaps to supply to a better advantage the Far Eastern markets.

The plant at Stoke-on-Trent, England, which began operations in 1927, is now fully entrenched upon the British market and from reports of the Michelin office it is supplying one-third of the consumption of the British Isles. The factory at Turin, Italy, was completely overhauled during 1929 and is now able to produce tires at that point more effectively than heretofore. Michelin is directly responsible for the growing Italian tire trade and represents, according to reports, 81 per cent of all the tires exported from that Kingdom.

Although Michelin inaugurated an expansion policy during 1929, French tire exports, which are principally from the Michelin factory, did not reflect a healthy condition. Michelin in 1929 for the first time in the history of its existence showed a deficit of some 8,000,000 francs. Nevertheless, Michelin continues to fight competition.

In 1929 France was the world's leading exporter of automobile casings. Exports increased the next year but they did not keep pace with the gain made by the United States with the result that the United States became the world's largest supplier. During 1928 France in company with Canada and the United States manifested declines, but during 1929 France decreased still further, while those of the United States and Canada increased. True, France lost the British market by the imposition of the McKenna duties of 1927 and the Michelin subsidiary is taking care of this loss, but it is significant that Michelin is losing ground in other markets where once it was the dictator of the prices and terms.

Developments Within the Dunlop Organization

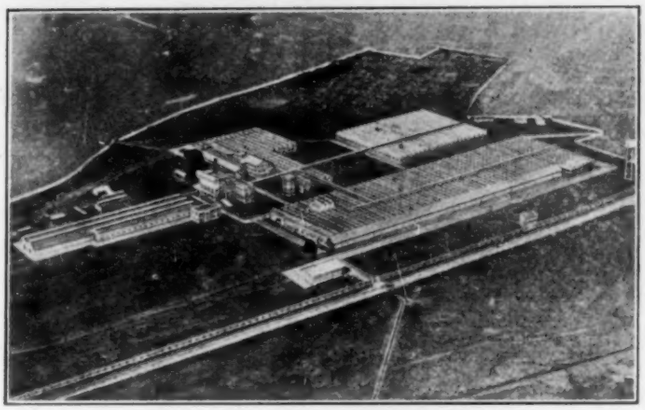
Michelin may be the center of the European tire industry yet the organization of the Dunlop Rubber Co. (Ltd.), of Great Britain, with subsidiaries in France, Germany, Japan, Canada, Australia, and the United States is more far reaching. Until 1929 the exports from Great Britain were of mostly Dunlop origin, but since the establishment of three United States subsidiaries, one French, and one Italian, the significant portion which Dunlop played in the British trade has been lost, although it is believed that actual Dunlop exports have not declined.

The Dunlop factory at Kobe, Japan, is one of the most important units of the organization and is responsible for the growing

the European During 1929

Principal Feature—Reverses Sustained More Interest in European Industry in the Smaller Countries

U. S. Department of Commerce



The British Plant of the Michelin Company at Stoke-on-Trent, England

exports from that country. Dunlap automobile casings are practically the only ones exported from Japan which increased from an estimated 206,850 units in 1928 to 227,300 in 1929. Japanese Dunlop is credited with supplying 40 per cent of the replacement sales in the Empire as well as the original equipment for all cars assembled at the local Ford and General Motors plants and also for the motor trucks manufactured in Japan.

The German plant at Hanau-on-Main supplies around 23 per cent of the total German consumption. Besides, German Dunlop acts as a distributing center to all the Central European States. The Dunlop plant at Montlucon, next to Michelin, is the largest producer in France and is credited with an average daily production of around 5,000 units.

The Dunlop plant in Australia merged with Perdriau and Barnet Glass, two other local factories, in order to fight the growing popularity of the Goodyear subsidiary. The first balance sheet of the merger, after providing for depreciation and taxation, showed a net profit of £549,932, which compares favorably with losses sustained by the individual companies during the previous year.

Pirelli Heads the Italian Industry

Societa Pirelli, of Milan, leads the Italian tire industry with various branch factories located in the Kingdom and with subsidiaries in Spain, Great Britain, and Argentina. The British plant, however, is the only subsidiary, where automobile casings are manufactured, the Spanish and Argentine plants being devoted to solid tires and other rubber goods. The company has considerable capital invested in Brazil and Count Pirelli, the president, on the occasion of a recent visit announced that the company contemplated the production of tires in Brazil in the near future.

The local replacement business is strongly contested by Michelin and Pirelli, but the former seems to be strong in certain centers while Pirelli is in the lead in others. Pirelli's total sales, however, top those of Michelin and are, it is estimated, greater than those of Michelin, Bergougnan, and Dunlop combined. Pirelli enjoys more than 50 per cent of the original equipment sales in Italy.

Although Italian exports of tires increased approximately 9 per cent in 1929, the tire industry has been in a rather unhealthy condition. The factories have been working on part time and it is understood that both Pirelli and Michelin have many thousands of tires stored.

The official export statistics do not give a true picture of the export trade of Italy, for the Goodyear company of Akron maintains a depot at Trieste where tires are shipped to nearby States. Inasmuch as Italian figures do not distinguish between re-exports and exports, many tires of American origin are undoubtedly included in the export statistics of the Kingdom.

Englebert of Belgium Expands

During 1929 Englebert of Belgium which is responsible for the increased production and exportation of automobile casings from that country took the first step towards a foreign subsidiary. The company now owns a plant at Aix-la-Chappelle, Germany, suitable for the production of tires. The Englebert tire sold in Germany immediately after the war, but since the rehabilitation of the German tire industry, the consumption of Englebert tires has declined. Its share of the German consumption in 1929, however, was around 8 per cent—greater than any single American make.

Semperit Organization of Austria

Another international European rubber concern which manufactures tires is the Semperit, of Vienna, Austria. Besides controlling the entire capital stock of Reithoffer, of Lower Austria, Reithoffer's Sons, of Upper Austria, and Calmon, of Vienna, it maintains important interest in the rubber industry of the Succession States of the former Empire, principally Matador, of Czechoslovakia. It furthermore holds a small interest in the Ungarische Gummifabrik, of Hungary.

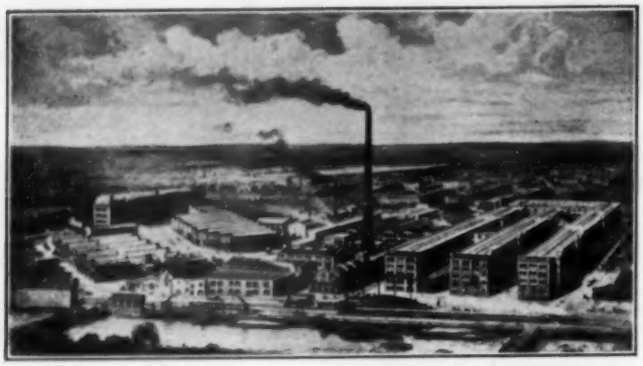
The Austrian tire industry is said to be in a satisfactory condition and will gradually secure a larger share of the local consumption. It was credited with supplying 25 per cent in 1929 as compared with 22 per cent in 1928. About 50 per cent of the local production, reputed to be around 66,000 automobile casings in 1928, is exported to the neighboring States. Although the exports for

Exports of Automobile Casings by Major Countries

Country	1926 *Number*	1927 *Number*	1928 *Number*	1929[1] *Number*
United States	1,654,584	2,811,192	2,692,896	2,979,438
Canada	1,152,070	1,679,126	1,674,553	1,746,950
France	1,914,595	2,111,985	1,812,405	1,478,080
United Kingdom	900,456	893,325	880,296	1,282,622
Italy	703,955	726,327	791,573	[2]840,000
Belgium	224,667	345,458	520,283	655,225
Germany	208,618	154,055	180,193	301,339
Japan	139,548	164,969	206,854	227,312

NOTE: The number of tires exported from France, Italy, Belgium, and Japan is estimated from reported metric weight.

[1]Preliminary figures, subject to revision.
[2]Estimated on basis of 10-months returns.



Plant of the Harburger Gummiwarenfabrik Phoenix A. G. at Harburg-Elbe, Germany

1929 are not available, it is believed that the increase of 38 per cent in 1928 over 1927 was fully maintained.

The Ungarische Gummifabrik, of Budapest, which produces tires under the trade name of "Cordatic" is now credited with supplying about 75 per cent of the local consumption as against 60 per cent in 1928. The increase is due entirely to the privileged position of the concern resulting from Government action in compelling the use of domestic-made tires on all motor vehicles in any way connected with public service. Production increased from 20,000 units in 1928 to 36,000 in 1929. Besides, the local factory supplies the original equipment on the locally-made automobiles which during the fiscal year ended June 30, 1929, numbered approximately 300. Exports of tires are so far negligible.

The domestic-made tire in Czechoslovakia is sold under the trade name "Matador", and at present supplies around 7 per cent of the local consumption. Although the participation is small, it is an increase when compared with 1928.

Continental a More Important Factor

The Continental Caoutchouc & Gutta Percha Co., of Germany, is confined entirely to that country, nevertheless, it is an important factor within the European tire industry. The centralization movement which that company originated in 1927 became more intensified during 1929 for in addition to acquiring interest in the Hannoversche Gummiwerke Excelsior A. G., in the spring of 1929, Continental secured a certain interest in Peters' Union, an important tire factory in Germany. The various plants of Continental underwent a complete overhauling during the past year; in many instances modern machinery was installed and antiquated methods were superseded by the latest procedure of present day business. Continental not only made great strides in production methods, but in the volume of output, in the quality of its products, and in turnover. The company supplies 45 per cent of the local German consumption and is responsible for the increased export trade which advanced 42 per cent in volume during 1929 as compared with 1928.

United States Interests in Europe

Brief mention may be made of the International B. F. Goodrich Corp., with factories in Great Britain and France. The latter is credited with third in importance in supply the French consumption and maintains a daily production average of 2,000 tires. Tires are exported to nearby markets. The Goodyear Tire & Rubber Co. (Ltd.), of Great Britain, is now entrenched upon the British market and is exporting tires to the Continent which was formerly supplied by the factories in America. The Firestone organization in Great Britain enjoyed a successful year and is now engaged in an enlargement of its factory to care for the increased demand.

The Seiberling Rubber Co., of Ohio, during 1929 took over the technical supervision of tire production at the German plant of Gummiwerke Fulda, and in return Seiberling will secure certain distribution rights in Germany for its American-made tires. The Seiberling Co. is also to be the technical adviser to the Soviet tire industry.

Many other local factories upon the Continent showed material increase during the year. Soviet Russia is now self-contained in its tire requirements, while Sweden, Denmark, and other countries reached a greater degree of self-sufficiency.

The Soviet rubber trust during 1929 began the construction of a tire factory at Yaroslav to cost approximately $22,500,000 with an annual production of about 4,000,000 units. The factory will also have a spinning and weaving mill for the production of cord and special fabrics, a plant for reclaimed rubber, and one for the production of carbon black. The production at the old Treugolnik works during the past year numbered 210,000 units.

For the past couple of years Soviet-made tires have been exported to nearby countries, but offered very little competition to other nationally known tires, for their comparably poor quality. Now that Seiberling has taken over the technical supervision of tire production, the quality will no doubt improve. Prices of Soviet-made tires are considerably below other makes and for this reason together with a written guarantee, they are experiencing increased sales in the adjacent countries.

Developments in Scandinavia

The Schionning & Arve, of Denmark, produced about 8,000 tires during 1929 and supplied fully 2 per cent of the local consumption. The books of the company now show increased earnings, while a dividend of 6 per cent to the stockholders has been paid after several years of financial reverses.

The Gislaved and Trelleborg, two Swedish makes, supplied the domestic consumption to a greater extent during 1929, or about 12 per cent of the total. The Swedish industry is gradually increasing production and offering more competition to important makes. It is reported that Gislaved's sales now exceeds those of Michelin, while Trelleborg is equal to those of Dunlop.

Local production has not as yet materialized in Norway, although a manufacturer of rubber goods has requested bids on tire molding machinery, for a capacity of 250 to 300 tires and tubes per day. The latest report states that the project is being held in abeyance for the time being, but it is only a question of time when tires will be made in Norway. Manufacture of bicycle tires was begun during the year.

The Industry in Other European Countries

R. & E. Huber, "Pallas," located in the Canton of Zurich, Switzerland, is the only manufacturer of tires in that country. The

Pirelli Works at Milan, Italy

approximate annual output is 5,000 tires. Up to the present it has been operated largely for the Swiss Government and about 90 per cent of the entire production is purchased by the military and post-office departments. It is not regarded by dealers as a competitor in the general trade.

Although rumors have been current regarding a tire factory for Latvia, nothing definite developed during 1929.

Poland reentered the ranks as a tire producing nation during 1929, when "Pepege," the largest rubber manufacturing plant in that country, began the production of automobile casings and inner tubes.

The local rubber industry of Finland has from time to time demanded of the Government an increased tariff on tires, in order to encourage a local industry but so far nothing definite has materialized. The Netherland tire industry is concerned chiefly with the production of bicycle tires.

Carryover of RUBBER FOOTWEAR *Little Changed*

THE Bureau of Foreign and Domestic Commerce announces that as a result of the survey of dealers stocks of waterproof rubber footwear as of March 1, 1930, made by the Rubber Division, 22,752 dealers reported 5,748,984 pairs on hand, an average of 253 pairs per dealer, against 26,675 dealers with 6,615,171 pairs, or 248 pairs per dealer, on July 1, 1929.

The varying market demand for rubber footwear in different parts of the United States is indicated by the percentages of dealers reporting stocks of each class of footwear for each region. For example, taking the total number of reporting dealers in New England as 100 per cent, the table shows 63.0 per cent of these dealers handling lumbermans and pacs, and 90.2 per cent handling rubbers, the highest percentage with stocks of these items in any region. The West South Central States, although furnishing a poor market for rubber footwear generally, show a higher percentage of dealers stocking rubber boots than any other area. The demand for rubbers and rubber boots varies less than for other items in different parts of the country. Arctics and gaiters of all kinds are most generally stocked in the North Central, New England, and Mid-Atlantic States. Compared with a similar table for last year's survey, fewer dealers in the East South Central States are stocking each class except rubbers, while in the Mountain States an increased percentage of dealers reported for every class. This year's increase in percentage of dealers stocking rubber style gaiters and rubbers was general throughout the United States, and the lower percentage of dealers stocking light arctics and gaiters was also general.

In order to show the percentage of dealers holding stocks of various sizes, special tabulations were made of dealers' stocks of rubbers and of total footwear. This table shows 59 per cent of the dealers with stocks of less than 100 pairs of rubbers, 27.7 per cent having stocks between 100 and 249 pairs, and so on. On July 1, 1929, there were 177 dealers with stocks of 1,000 or more pairs of rubbers, their total stocks being 627,087 pairs, against 172 dealers with 632,228 pairs March 1, 1930. The table also shows the number of dealers and volume of stocks of all waterproof rubber footwear in various groups, and the percentage of total stocks is also shown for each group.

A special tabulation has been made of the stocks of 32 very large distributors including mail order houses, chain store organizations and some jobbers and large retail dealers. These 32 "large distributors" reported total stocks of 962,982 pairs of footwear on March 1, an average of over 30,000 pairs for each firm.

The state with the highest average stocks was Massachusetts with 441.2 pairs per dealer, followed by Rhode Island 402.8, New Hampshire 3979.4 and New York 374.4. States with the lowest average stocks were Mississippi with 40.9 pairs per dealer, Texas 51.7 and Florida 53.2.

As in the survey of July, 1929, dealers were asked to state the number of different makes of rubber footwear which they handled. In the 1929 survey, only 19,426 dealers out of 26,675 answered this question, over 26 per cent not answering, but this year only 4,523 out of 22,752 dealers, or 19.9 per cent, failed to answer. As a result of this higher percentage or replies, probably a truer picture is presented, and we find on analysis of the replies that a higher percentage of the dealers are handling only one or two makes than appeared from the 1929 survey; if all dealers reported, it is likely the percentages handling one and two makes would be still further increased. Of the dealers reporting one to six makes handled, 40.0 per cent handled but one make this year against 37.9 per cent in 1929.

TOTAL REPORTED STOCKS, SHOWING AVERAGE PAIRS PER DEALER

	July 1, 1929			March 1, 1930		
	Number of Dealers	Number of Pairs	Pairs per Dealer	Number of Dealers	Number of Pairs	Pairs per Dealer
Rubber boots	19,828	588,102	29.3	16,673	550,250	33.0
Lumbermans and pacs	10,017	294,304	29.3	8,605	243,465	28.3
Heavy arctics and gaiters	15,839	579,047	36.6	13,423	473,351	35.3
Light arctics and gaiters	15,350	910,485	59.3	12,332	608,678	49.4
Style gaiters, cloth	12,378	770,460	62.2	11,015	628,513	57.1
Style gaiters, rubber	8,353	378,684	45.3	8,783	374,921	42.7
Light & heavy rubbers	20,704	3,094,089	149.5	19,049	2,869,805	150.7
	26,675	6,615,171	248.0	22,752	5,748,984	252.7

PERCENTAGE OF DEALERS REPORTING EACH CLASS OF FOOTWEAR, BY REGIONS

Regions:	Rubber Boots	Lumbermans & Pacs	Arctics and Gaiters Heavy	Arctics and Gaiters Light	Style Gaiters Cloth	Style Gaiters Rubber	Rubbers	Total Dealers
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
New England	73.5	63.0	63.8	69.4	52.6	37.5	90.2	100.0
Middle Atlantic	76.2	56.6	71.6	68.7	58.5	45.5	89.2	100.0
E. No. Central	80.8	49.2	76.9	68.6	61.8	52.5	89.2	100.0
W. No. Central	70.7	29.3	79.6	72.8	59.1	44.8	87.6	100.0
So. Atlantic	66.6	24.9	40.2	31.7	34.6	24.1	85.2	100.0
E. So. Central	53.8	11.7	24.9	22.3	25.3	21.3	73.3	100.0
W. So. Central	84.1	9.0	23.3	26.4	17.2	17.2	57.2	100.0
Mountain	68.6	43.5	70.5	58.8	51.7	40.7	78.2	100.0
Pacific	73.8	35.7	19.9	17.2	34.8	31.3	81.2	100.0
TOTAL U. S.	73.3	37.8	59.0	54.2	48.4	38.6	83.7	100.0

DEALERS CLASSIFIED BY VOLUME OF STOCK

	Rubbers Only				Total Rubber Footwear			
	Dealers		Stocks		Dealers		Stocks	
Volume of Stocks	Number	% of Total	Pairs	% of Total	Number	% of Total	Pairs	% of Total
1- 99	11,238	59.0	479,260	16.7	10,301	45.3	527,785	9.2
100-249	5,278	27.7	818,779	28.5	6,617	29.1	1,101,344	19.2
250-499	1,843	9.7	610,028	21.3	3,696	16.2	1,298,654	22.6
500-999	518	2.7	329,511	11.5	1,617	7.1	1,106,997	19.2
Over 999	172	0.9	632,228	22.0	521	2.3	1,714,204	29.8
TOTAL	19,049	100.0	2,869,806	100.0	22,752	100.0	5,748,984	100.0

NUMBER OF MAKES OF FOOTWEAR HANDLED

	July 1, 1929		March 1, 1930	
Number of Makes	Dealers	Per Cent of Total	Dealers	Per Cent of Total
Not Reporting	7,039	26.4	4,523	19.9
One Make	7,354	27.6	7,219	31.7
Two Makes	7,680	28.8	6,991	30.7
Three Makes	2,981	11.2	2,610	11.5
Four Makes	894	3.3	759	3.3
Five Makes	324	1.2	295	1.3
Six Makes	193	0.7	158	0.7
Seven Makes and Over	210*	0.8	197	0.9
TOTAL	26,675	100.0	22,752	100.0

*Estimated.

Dr. Gibbons Talks on the VALUE *of* RESEARCH *in the* Rubber Industry

IN AN address before the Illinois Manufacturers' Costs Association on the subject, "Scientific Research as a Function of Business," at the Hotel La Salle, Chicago, on February 24, Dr. W. A. Gibbons, director of the development department of the United States Rubber Company, said:

"One measure of the importance of an invention is the industrial growth which it brings about; another is the amount of research and development to which it gives birth. After 90 years Goodyear's invention has not been exhausted.

DR. W. A. GIBBONS

"Goodyear's discovery, which founded a new industry, was but the first of a long series of developments which have affected both the quality and cost of rubber goods.

"Seventeen years ago, crude rubber cost $1.13 a pound. Today, although it is subject to considerable variation, a rough average would be 20 cents a pound. In 1913 a small-sized tire cost $25, as compared with $10.50 in 1930. A tire of 1913 would deliver around 2,500 miles; that of today 15,000 to 20,000. The 1913 tire gave 100 miles per dollar. The 1930 tire gives 1,400 miles per dollar. These figures do not take into account the fact that the buying power of a dollar with respect to other commodities has fallen considerably during the period from 1913 to 1930. Basing our figures on a comparison of commodities rather than dollars, the price of a ready-made suit of clothes in 1913 was around $25, or equal to the cost of a tire of the period. In other words, for the price of a suit one would obtain a tire giving 2,500 miles. The price of the same suit of clothes today is $50; enough to buy five modern tires giving a total mileage of 75,000 miles. Thus, on a commodity rather than on a dollar basis, the ratio of the new tire to the old so far as the value to the consumer is concerned is as 75,000 is to 2,500 or 30 to 1. The scientists and engineers have been responsible for the greater part of this development . . .

"A great deal of work has been done on the use of organic chemicals in rubber to increase the rate of vulcanization, and, as a result, the actual curing time has been reduced by about two-thirds. This has not only improved the product but has made enormous savings in equipment, labor, floor space and heat. Dr. Geer in 1927 estimated that the development of accelerators had saved $200,000,000 to the consumer in improved quality, and another $200,000,000 to the manufacturer by reducing operating costs.

"There are, however, other developments of a much more far-reaching nature now in process. One of these is the application of latex to rubber and other industries. I feel quite confident that if latex had been as available one hundred years ago as it is today, many of the rubber articles which are now made from dried rubber would have been made directly from latex, and it would remain for some later discoverer to develop the manufacture and application of dry crude rubber as we now know it. However, it was not practical to obtain latex until the plantation industry had developed, so accordingly our entire rubber practice until about 1920 was based on the use of crude rubber in the dry form. Latex is finding considerable application in the manufacture of paper and similar products, as an adhesive and backing material for carpets, rugs, etc., as well as in the direct manufacture of standard types of rubber goods. This work has been made possible largely by careful and fundamental studies of latex which are being made in various laboratories and which constantly bring out new properties of the material which suggest new uses and new methods of application. No rubber manufacturer today can afford to overlook latex. Here we have an example of a change going on before our very eyes which contains within itself the possibility of revolutionizing the methods of manufacture of many standard lines of goods and also contains the promise of broadening the use of rubber in the arts. Developments of this sort are in fact a promise to the organization or industry which utilizes them, but a menace to those who disregard them."

Ford's Brazilian Rubber Venture

NEWS as to just what progress is being made on the Ford rubber plantation project in the Tapajoz River region of Brazil is decidedly meager, but in the absence of any statement from the Ford Company reports from travelers would indicate that approximately 2,500 acres have been cleared around Boa Vista, the headquarters of the plantation venture, 150 miles up the Tapojoz from Santerem, which is the junction point where the river meets the Amazon. Of this area only 1,000 acres are reported to have been planted, but work is continuing on another large tract.

In a news dispatch in the *Manchester Guardian Commercial,* of Manchester, England, it was reported that the first 1,000 acres planted last July proved a failure, operations being hindered by bad felling, bad "burns" and the lateness in planting. The article continues as follows:

"The jungle was felled regardless of method, the burning was not properly carried out, and, as there was no time for cleaning-up work owing to the time limit established by the Government, 'avenues' were run up in this partly burnt area and planted. The plants suffered severely from the dry weather and almost all withered and dried up—a few being kept alive with the aid of watering cans. The nurseries, holding some 180,000 seeds, started in February, were too small to allow for 'pulling,' so seedlings were obtained from various parts up the river for planting this area, the nurseries being called upon to provide 'supplies' and to fill up vacancies caused by the dead plants. These also followed the way of the others and died. It has been suggested that the only way to deal satisfactorily with this first thousand acres is to tackle the half-burnt jungle again and reburn.

"The second thousand acres has been cleared in a business-like manner and the 'burns' have been excellent. Plants for planting these areas have been obtained from the upper reaches of the Tapajoz and from beyond Manaos.

"With regard to construction work, the following have been completed or are in course of erection: Hospital, consisting of two floors, with 80 beds, power-house, sawmills, garage and repair shops, five temporary bungalows, landing-stage, an interior camp for laborers who are working too far away from the base to return at night, a road seven kilometers in length connecting this camp with Boa Vista, vegetable and fruit gardens and water supply works.

"Labor is plentiful, and consists of men from the jungle, men off ships, shopmen, and stevedores. The present crisis in trades and professions in North Brazil is responsible for this good supply of labor of all kinds, though it is rather of the 'come and 'go variety.

New York Rubber Group Discuss Rubber Statistics and Cotton Fibers

Stretch Properties of Cotton Studied—Holt Recounts History of Rubber Statistics and Stresses Their Value—Long vs. Short Staple Cotton

AT THE meeting of the New York Group of the Rubber Division, A. C. S., held the evening of March 28, at the Town Hall Club, New York City, the members and guests listened to three talks touching on the two basic materials used in the rubber industry, rubber and cotton. Dinner was served preceding the meeting. Songs and an entertaining demonstration of "black magic" by W. H. Grote, enlivened the evening. Brief extracts of the talks are given below.

Getting Better Acquainted with the Stretch Property of Cotton

B. H. FOSTER, *United States Rubber Company*

THE paper contained some interesting investigations, most of which were original, which were conducted at the U. S. Rubber Textile Laboratory for the purpose of studying the behavior and characteristics of the stretch property of cotton. In many cases it was necessary to design and develop special apparatus in order to conduct the tests.

The first part dealt with the effect of humidity or moisture. It showed, first, that stretch increases as the humidity increases; second, that the atmospheric conditions to which material are exposed just previous to bone drying has a marked effect on the bone dry stretch measurement, a point apt to be overlooked in the testing room; and third, that material in transit or in storage, if exposed to alternate dry and rainy weather conditions, will show an increase in stretch.

An apparatus was shown for measuring the amount of shrinkage of the cotton when immersed in water, and also the amount of tension set up by such shrinkage.

An apparatus was also described by means of which an experiment was made to show the effect that difference in stretch between two piles of fabric had on the resultant strength. The results showed that the greater the difference in stretch, the greater the loss in resultant strength.

Another apparatus was described which makes it possible to measure stretch of tire cord continuously over lengths and at varying loads. The results of stretch measurements of a low and a high stretch cord were shown.

These investigations lead to the conclusion that:

1. Moisture plays an important role with the stretch property of cotton.
2. Difference in stretch between two plies of fabric greatly reduces the resultant strength.
3. There is need of an apparatus having greater precision to measure the amount and uniformity of stretch under varying loads.

Discussion

Conducted by J. E. SKANE, *Raybestos-Manhattan, Inc.*

On curve #1 you showed the stretch under 10 lbs. at 70% R.H. to be 14%, at 85% R.H. to be 17½%, and at 45% R.H. to be 12%. Many times we have tested belts on dry days at 45% R.H. and in the heat and high humidity of a summer's day at say 85% R.H. and have obtained highly divergent results. Under such conditions, from results taken from your curves we may obtain stretch results varying from 12% to 17½% at the humidities mentioned, in other words an increase of 46% stretch on the day of high humidity when based on the stretch of the day of low humidity. This is very significant when testing belts for specifications.

Under the same variable atmospheric conditions, fire hose (Underwriters) is tested. Variations in stretch occur here, and it is quite difficult for some of the inspectors to understand why such variations in stretch should take place. Mr. Foster's paper has given us some food for thought on this matter.

Slide #6 was very significant. Who has not tested a number of 4, 5, 6 and 8 ply belts in a tension testing machine and has not been dismayed at some of the results obtained. I have seen 4" x 4 ply belts break at loads varying from 275 lbs. per inch per ply to 375 lbs. per inch per ply. Of course, some of the causes may be traced to irregularities of manufacture, but how much of this variation is due to atmospheric conditions?

This leads me to the main point of my discussion. Mr. Foster has shown you variations in one of the chief materials, that go into the manufacture of rubber goods. The cotton manufacturers that supply us with this raw material will not agree to meet our specifications on it unless we test under standard conditions. Yet, we who use cotton goods over again in another form, test at any time, or under any atmospheric conditions whatever may they be at the time of test. Sometimes we meet specifications, sometimes we don't. Is it not reasonable then to suggest that finished rubber goods such as belts, fire hose, clothing, packing, etc., containing cotton, be tested under standard conditions? No doubt we would obtain more regular results and at least eliminate one of the variables, i.e., prevailing atmospheric conditions.

Crude Rubber Statistics

E. G. HOLT, *Chief, Rubber Division, Dept. of Commerce*

STATISTICS on crude rubber would include records of the acreage planted annually in each producing country, records of annual production and exports, records of stocks held by producers and dealers in rubber producing countries, stocks afloat on the high seas between producing and manufacturing countries, imports into manufacturing countries, reexports from manufacturing countries, and consumption and stocks in manufacturing countries. In addition, the crude rubber statistician constantly uses records of reclaimed rubber consumption, automobile tire production, automobile production, gasoline consumption, automobile registration, and others as the conditions of the industry warrant.

The history of rubber statistics is for purposes of this discussion divided into three periods. The first period begins with the earliest records of the trade in rubber and lasts until the world trade slump of 1919-20. We may call it the Pre-Restriction period. The only statistics available for this period of ancient history are those pertaining to the exports of rubber from producing countries and the imports of rubber into manufacturing countries. The official Government reports in which these statistics are published often classified rubber, gutta percha, balata, jelutong and similar substances together, making the records for rubber alone impossible to obtain. Often the official reports failed to show reexports of rubber for countries where rubber was both imported and exported, making it impossible to calculate the net imports or net exports.

The trade cataclysm of 1919-20 introduced the second period in the history of rubber statistics, which may be called the "Restriction" period. During the year of voluntary restriction of rubber production by 25 per cent on the part of British and Dutch estates, October, 1920, to October, 1921, the producers succeeded in having the Governments of British Malaya, Ceylon, the Dutch East Indies,

and British India make surveys of the acreage planted to rubber in each country. The Malayan census showed the total acreage planted to rubber at the end of each year from 1917 to 1921, a Ceylon census was taken in 1919 and again in 1921, and annual records of acreage planted, acreage abandoned, acreage tapped, and annual production were instituted for rubber estates in British India and the Dutch East Indies. Accompanying this development, which gave the producers a pretty good idea of the potential production of rubber for the next few years, there was introduced a system of reporting the month-end stocks held at London, Liverpool, Amsterdam, and Antwerp. Then, after restriction was undertaken by the British Government in 1922, a system of reporting dealers month-end stocks of rubber in Singapore and Penang was begun in June, 1923; and in January, 1927, the Malayan restriction authorities began to compile statistics of stocks of rubber held by estates and dealers in the Federated Malay States and Mainland parts of the Straits Settlements on a quarterly basis. Statistics of dealers' stocks in Colombo, Ceylon, were also reported quarterly from March, 1922, on.

While these developments were taking place on the side of rubber producers, Americans had not been idle. Just as the trade slump of 1920 forced rubber producers to face facts, so it caused American rubber manufacturers to realize they needed statistical guidance as an aid to business judgment. The Rubber Association of America made annual surveys of rubber consumption and year-end stocks for 1919 and 1920, semi-annual surveys in 1921 and 1922, quarterly surveys in 1923 and 1924, and monthly reports since October, 1924, covering the consumption and stocks of crude rubber and reclaimed rubber. Monthly reports of production, inventory, and shipments of automobile tires and inner tubes, were also instituted by the Association in 1921. The Department of Commerce established the Rubber Division chiefly to promote export trade in 1921 and for the first time began reporting promptly the monthly U. S. imports and reexport of crude rubber early in 1922, conducted a world wide survey of rubber production in 1923-25, instituted a statistical service on crude rubber imports and exports of all countries in the world in 1926, and beginning August, 1926, provided official statistics of weekly rubber shipments from the chief producing countries to the United States to advise the American trade definitely concerning future rubber arrivals and prevent price disturbances often incidental to false reports on this subject. Also, in order to enable the Rubber Association to determine the degree of completeness of its various statistics on consumption, the Rubber Division made its first surveys of United States annual consumption of reclaimed and crude rubber in 1925, 1926 and 1927.

We are now only in the beginning of the third period of the history of rubber statistics, the "Free Trade" period which opened with the British Prime Minister's announcement in April, 1928, that restriction was to be abolished.

Since the end of restriction there have been further valuable additions to the data available for rubber statisticians. Most important of all, the authorities in British Malaya have released much of the information regarding acreage planted to rubber annually in that country since 1922, which had been gathered in connection with the administration of restriction. In June, 1928, they instituted a regular monthly report covering each political division of the country separately, showing the production of rubber on estates over 100 acres in size, the stocks held by such estates and also by rubber dealers at the end of each month, and the exports from each region.

This improvement in statistical data should inspire greater confidence in the use of statistics by rubber manufacturers and traders. In my contact with the industry I have been impressed by the very limited number of companies, either manufacturing or trading, which maintain any comprehensive statistical records on crude rubber. Formerly it was only possible to secure these statistics at great expense which made it beyond the means of all but the largest companies. Today the information can be secured either free of charge or at nominal cost from the Government.

A constant study of the statistics would be of aid to every purchasing agent and every rubber trader.

Discussion

Read by H. L. Fisher, in the absence of J. McGavack, *United States Rubber Co.*

Mr. Holt's figures are all interesting for a number of reasons: They are well presented. They give a clear picture of the different sections of thought in the different periods through which the crude rubber industry has travelled. Excellent suggestions are made of the uses to which such statements may be put. They emphasize the rapid growth of the rubber industry, pointing to very logical uses of synthetic rubber.

One of the things I would like to ask Mr. Holt is the specific manner in which a lot of this data was calculated, also if these statements include figures for the importation of crude latex.

Textile Fibers

J. W. Cox, Jr., *Textile Engineer, New York City*

MR. COX'S talk was breezy and full of humor. He refuted the theory that long staple cotton was necessarily the strongest for tire fabrics and emphasized the important factor of the spirality of fibers and the efficiency to be gained by various combinations of cotton fibers. He urged that more cooperation exist between the rubber industry and the cotton fabric industry and expressed the belief that more satisfactory service in fabrics could be obtained if the rubber industry would present its specific fabric problems to the fabric industry and have it meet rather than let the fabric industry go to the rubber manufacturer and sell him on a highly competitive price basis.

New Works on Rubber Technology

THE current year will see the publication of two new works on rubber technology that should be of interest to research workers in the respective fields covered. The first is to be a detailed summary of the work done to date on the structure of rubber and elastic colloids in general by Dr. Ernst A. Hauser, of Frankfurt, Germany. It will be issued as an American Chemical Society monograph by the Chemical Catalog Company, New York City, under the title, "The Structure of Rubber and Elastic Colloids."

The second volume, which is still in the process of preparation, will be the first attempt to present a complete study of the reclaiming of scrap rubber between the covers of a single book. It is being prepared by Dr. A.-D. Luttringer and will be published by A. D. Cillard, Paris, France, under the title, "Régénération des Déchets de Caoutchouc."

The Goodyear House in Naugatuck

The home of Goodyear which he occupied in Naugatuck, Connecticut, shown in the accompanying illustration, to which place he moved from Woburn, is still standing and is well preserved. It was here that he improved his process and first succeeded in bringing manufacturing operations to a degree of perfection which made it possible to market his rubber products.

Where Charles Goodyear Lived in Naugatuck

Rubber Goods Sales Top Billion Dollar Mark

Total Value of Shipments Lowered by Drop in Automobile Tires, But Crude Rubber Consumption in 1929 Made All-Time Record

THE domestic rubber industry's high records in 1929 are definitely confirmed by the annual summary of quarterly reports of the Rubber Manufacturers Association. More crude rubber was consumed by both the tire plants and the miscellaneous rubber goods factories than ever before, and the latter set a new peak for the value of their output.

The total sales value of all rubber goods shipped in 1929 was $1,146,918,500—a slight decline from the 1928 total of $1,195,423,900 due to the lower unit prices on tires. This is the fifth successive time that the value of American rubber manufactures has passed the billion-dollar mark, though the low tire prices brought the 1929 total under that of any other year since 1924.

Tires, tubes and tire sundries accounted for $764,160,900, or 66.6% of the total sales value of all rubber goods, whereas in 1928 these items represented over 70% of the total. The value of other rubber products shipped last year was $382,757,600. Total rubber consumption was 466,475 tons, of which tires and related items used 393,264 tons and other rubber goods 73,211 tons.

The figures below are estimated by the association to represent 92% of the industry in the United States, but those quoted in this article have been raised to represent 100% of the domestic industry.

Comparative Table of Value of Rubber Goods Shipments from Manufacturing Plants and the Amount of Crude Rubber Consumed for the Last Five Years

Total Sales Value of Manufactured Rubber Products Shipped
Thousands (,000) omitted

	Product	1929	1928	1927	1926	1925
	Tires and Tire Sundries					
1	Auto and Truck Casings	$578,981	$622,557	$624,746	$680,026	$618,266
2	Auto and Truck Tubes	82,931	94,854	99,567	121,891	117,631
3	Motorcycle Casings and Tubes	1,348	1,834	2,128	2,083	2,189
4	Bicycle Casings and Tubes	2,877	2,845	2,470	2,860	3,011
5	Aeroplane Casings and Tubes	454	411	839	425	450
6	Solid and Cushion Tires	17,203	24,694	33,190	36,098	40,842
7	All Other Solid Tires	2,365	2,602	1,032	898	1,440
8	Tire Sundries and Repair Materials	16,868	21,269	21,447	22,514	19,830
	TOTAL—Tires and Tire Sundries	$703,027	$771,066	$785,419	$866,795	$803,659
	Other Rubber Products					
9	Mechanical Rubber Goods	$111,195	$102,258	$98,273	$98,258	$102,607
10	Boots and Shoes	110,856	93,875	103,892	114,594	100,675
11	Insulated Wire and Insulating Compounds	33,126	34,432	34,075	35,487	33,379
12	Drug Sundries, Medical and Surgical Rubber Goods	8,141	8,492	14,048	12,931	13,711
13	Stationers' Rubber Goods†	2,560	2,746	.....	.....	.....
14	Bathing Apparel†	2,987	2,347	.....	.....	.....
15	Rubber Clothing*	8,536	8,438			
16	Automobile Fabrics*	10,627	9,110	27,383	22,662	21,754
17	Other Rubberized Fabrics*	9,493	9,695			
18	Hard Rubber Goods	6,795	7,345	8,073	10,355	12,719
19	Heels and Soles	23,759	23,653	19,616	18,373	27,565
20	Rubber Flooring	4,584	4,707	4,884	4,241	xx2,971
21	Sporting Goods, Toys and Novelties x	7,612	7,582	.....	.....	.....
22	Miscellaneous	11,867	14,044	17,717	22,326	23,056
	TOTAL—Other Rubber Products	$352,138	$328,724	$327,961	$339,227	$338,437
	GRAND TOTAL—All Products	$1,055,165	$1,099,790	$1,113,380	$1,206,022	$1,142,096

Crude Rubber Consumed—Long Tons

	Product	1929	1928	1927	1926	1925
	Tires and Tire Sundries					
1	Auto and Truck Casings	289,118	271,487	223,159	209,818	213,724
2	Auto and Truck Tubes	56,683	56,403	47,505	50,608	58,802
3	Motorcycle Casings and Tubes	259	412	403	318	406
4	Bicycle Casings and Tubes	1,277	966	720	755	811
5	Aeroplane Cas- and Tubes	178	116	30	.....	1
6	Solid and Cushion Tires	8,990	12,220	13,667	15,073	18,462
7	All Other Solid Tires	805	634	373	327	461
8	Tire Sundries and Repair Materials	4,493	6,101	5,329	4,757	4,319
	TOTAL—Tires and Tire Sundries	361,803	348,339	291,186	281,656	296,986
	Other Rubber Products					
9	Mechanical Rubber Goods	22,282	17,894	15,614	15,145	18,749
10	Boots and Shoes	18,974	16,894	16,524	14,245	13,203
11	Insulated Wire and Insulating Compounds	3,814	3,444	3,481	3,047	3,201
12	Drug Sundries, Medical and Surgical Rubber Goods	2,038	1,577	2,330	2,112	2,360
13	Stationers' Rubber Goods†	1,326	1,271	.....	.....	.....
14	Bathing Apparel†	765	627	.....	.....	.....
15	Rubber Clothing*	1,479	1,248			
16	Automobile Fabrics*	1,277	961	4,042	2,506	2,653
17	Other Rubberized Fabrics*	2,354	2,237			
18	Hard Rubber Goods	1,273	1,110	702	1,137	2,495
19	Heels and Soles	6,318	5,591	3,922	4,312	8,188
20	Rubber Flooring	1,122	1,062	922	867	xx661
21	Sporting Goods, Toys and Novelties x	1,565	1,380	.....	.....	.....
22	Miscellaneous	2,767	3,214	4,003	4,715	5,377
	TOTAL—Other Rubber Products	67,354	58,510	51,540	48,086	56,887
	GRAND TOTAL—All Products	429,157	406,849	342,726	329,742	353,873

*Formerly included under the heading "Waterproof Cloth and Clothing (except Rubber Sheeting)."
†Formerly included in "Druggist Sundries, Medical and Surgical Rubber Goods."
xFormerly reported in various classifications.
xxThree quarters only.

Canada's Trade in Rubber Goods During 1929

THE Dominion of Canada now ranks among the first five rubber-manufacturing and exporting countries in the world according to reports of the U. S. Department of Commerce. The trade in rubber goods for 1929 experienced a decrease of less than 1 per cent in imports but an increase of 5 per cent in exports. Imports were valued at $5,394,302, whereas exports were peaked at $32,095,695, leaving a surplus of exports over imports of $26,701,393. This large surplus and the decline in imports indicate that Canada in its rubber-goods requirements is becoming more and more independent of other countries.

Value of Canadian Trade in Rubber Goods

Year	Imports	Exports	Excess of exports over imports
1926	$4,881,855	$25,619,526	$20,737,671
1927	5,210,424	27,734,178	22,523,754
1928	5,412,032	30,614,525	25,202,493
1929	5,394,302	32,095,695	26,701,393

A study of the import list of rubber goods for 1929 shows that Canada still buys from foreign markets—mostly the United States—comparably large quantities of reclaimed rubber and hard rubber in tubes, sheets, and other forms for fabrication into the finished product. Imports of mechanical rubber goods increased and, notwithstanding the fact that Canada now ranks second to the United States as an exporter of automotive rubber goods, there was an advance in the importation of tires.

Exports of rubber footwear and miscellaneous rubber goods from Canada advanced in value by more than $1,100,000. The large increase in the miscellaneous class indicates that Canada is becoming more self-sufficient in such articles as water bottles, gloves, bathing caps, toys, and the many household rubber articles for which Canada formerly depended upon the United States and Great Britain for the greater part of its domestic consumption.

Automotive rubber-goods exports, which comprise about 59 per cent of the total Canadian exports of rubber goods, increased by 5 per cent in volume in 1929, as compared with 1928, but decreased in value by 5 per cent, or to $18,820,357 from $19,708,392.

Imports of automotive rubber goods were valued at $343,382 as compared with $329,798. An increase was noticeable in both volume and value of bicycle casings, as well as all kinds of solid tires, but the bulk of the imports was in the heavy casing size for trucks and busses.

New Zealand was again the leading market for automobile casings, taking 260,584 units out of a total of 1,746,950. The British preferential tariff and the proximity of the Canadian tire factories made New Zealand an ideal market for Canadian-made tires.

Argentina, the second best outlet, remained in the same relative position as it did in 1928, but with a large increase in both volume and value. The Union of South Africa was again in third place—also with an increased participation. The preferential tariff granted Canadian-made goods and the improved steamship service now existing between the Dominion and the Union have contributed to a greatly increased commerce between the two British possessions.

To the Brazilian market Canada shipped almost as many tires as the United States. Exports to British India declined in both volume and value, apparently for the same reason as United States tire exports have decreased to that country. A few of the contributing factors are better transportation between the United Kingdom and India and a greatly increased production and exportation at the English factories.

Exports of rubber footwear increased to a value of $9,737,560 from $8,601,868 in 1928, or by 13 per cent. In the exports of rubber footwear Canada is rivaling the United States as the principal world supplier, but the results for 1929 show that the United States still maintains the lead. On the other hand, imports of rubber footwear declined to $86,956 from $229,553, or by 62 per cent.

Exports of boots and overshoes increased to 2,319,938 pairs from 2,046,081 pairs.

Exports of mechanical rubber goods increased in 1929 to a value of $828,232 from $728,108 in 1928. Those of rubber belting were valued at $554,609 and rubber hose at $292,623—both manifesting gains. Imports of mechanical rubber goods, however, advanced slightly in value—to $472,619 from $412,634.

Exports of the miscellaneous group increased to a value of $2,679,546 from $1,576,247, or by 70 per cent. The large increase in this group indicates that Canada is becoming more self-sufficient in the consumption of various small rubber sundries and specialties and also that a surplus is apparent affording an outgoing trade to new markets.

Imports of rubber gloves increased to a value of $21,445 from $19,581; water bottles to $48,794 from $31,235.

Rubber in Automobile Construction

IN one of the papers presented as a part of a symposium on developments in automotive materials at the Detroit regional meeting of the American Society for Testing Materials, March 19, Walter C. Keys, chief engineer of the automotive development department, of the United States Rubber Company, Detroit, Michigan, spoke on the "Advances in Rubber for the Automotive Industry."

In the course of his remarks, he listed the following parts made of rubber which are to be found in 1930 models of automobiles:

Tires and tubes
Axle bumpers
Spring shackles
Body sill anti-squeak
Hood ledge covering
Door bumpers
Windshield channel
Windshield wiper
Spark plug thimbles
Grommets for wires and tubing
Engine mountings
Gear shift ball
Kick plates on dust shield
Running board covering
Floor and toe board covering
Hood corner protectors
Hood latch bumpers
Tubing
Insulated wire
Steering wheel
Fan belt
Head lamp wire (covered with rubber which will not tarnish silver)
Car bumpers (front and rear)
Car bumpers of steel with rubber insulating pads
Pedal pads
Accelerator button
Horn button
Distributor head
Water hose
Distributor thimbles
Battery jars and case
Door handles
Radiator cap
Radiator shims
Shock absorber link cushions
Vibration dampeners
Hydraulic brake parts (pistons, boots and pressure hose)
Universal joint parts
Window channel
Toplight frame
Sealing washers around pedal slots, etc.
Step pads
Magneto coupling
Windshield post pad
Floor boards with vulcanized rubber coverings
Running boards with vulcanized rubber coverings
Shaft coupling
Rubber molding
Truck cab mountings
Passenger car body mountings
Brake lining containing rubber
Windlace tubing around doors
Fabric and carpet containing rubber
Clutch hub—rubberized fabric
Door checks
Door dovetails
Steering column bushing
Tire valve cap and core seals
Hard rubber connectors of electric wiring
Rubberized fabric roof covering
Wind seal (rear windows and bottom of doors)
Bumpers on open car top support irons
Hood center bumper
Gaskets
Sponge rubber arm rests

Some Factory Problems in Tire Manufacturing*

By H. B. UNDERWOOD

Ajax Rubber Company

EVERY manufacturing operation has its own peculiar factory problems and I suppose every factory man, whatever the character of the industry, believes his problems to be the hardest and the most numerous.

The problems of the rubber industry, as regards materials, are usually dependent on the lack of uniformity of the basic material—rubber. If one is familiar with the methods of the preparation of rubber on the estate, it is not remarkable that there is variability in rubber as we get it. A single shipment of rubber may contain some rubber from a scientifically controlled estate as well as rubber coagulated by natives under very crude conditions. As long as rubber is bought and graded on appearance, like apples or potatoes, there will always be considerable variation in its action in the factory.

One of the first variations noted in past years was the variation in rate of cure. I believe this variation still continues but its extent in the factory is now minimized by the "levelling off" effect of the modern accelerators. However, it is well to blend different lots of rubber as much as possible to further cut down this variation.

Variations in Plasticity

Another source of trouble is the constant variation of rubber as regards plasticity. Part of this may be due to variation in mixing conditions but for the most part it is due to the inherent difference of plasticity in the rubber itself. This variation causes numerous troubles around the plant, ranging from dry stock and blooming troubles, if the plasticity is below normal, to tacky stock and sticking to liners, etc., if the plasticity is too high.

The most satisfactory way to fight this variation is by determining the plasticity of every batch of stock mixed, using the Williams Plastometer or some modification of it. The plasticity being thus predetermined, a number of these troubles may be headed off before the stock is calendered. Automatic control of temperature of mills and calenders also cuts down troubles of this sort.

It is increasingly important to standardize the plasticity of mixed stock as in certain articles, such as molded tubes, a slight variation in plasticity is sufficient to cause blemished tubes and consequent increase in the number of "seconds."

In the manufacture of tires, fabric is the second most important material. Assuming that the fabric specifications have been so drawn up as to give the desired qualities in the tire, it then becomes a factory problem to so handle the fabric that there is no distortion during the processing. In other words, unless due care is taken in the matter of tensions during the calendering operation, the stretch in the cords may be removed to such an extent that the cords in the tire do not have enough reserve stretch and as a result fabric breaking ensues.

There is one point in the handling of processed fabric which is often overlooked; namely, running too close to the calender with not enough bank of fabric waiting to be put through the bias cutter. This results in some fabric being cut while still warm and other rolls cut after being cold; this variation causes a variation in the amount of trim when the tire is built and usually causes excessive scrap.

The next most important material in the tire is carbon black. During the past year much attention has been paid to variations in this material which previously had escaped notice. Time will not permit enlarging on this point but in brief it has been found that certain carbon blacks absorb accelerators to a greater or less degree than certain other blacks, thus causing a variation in the rate of cure of the stocks containing them. One way of avoiding this is to put the accelerator in last, thus cutting down the time during which the carbon black is in contact with the accelerator at the relatively high temperature of mixing.

The carbon black manufacturers are doing a lot of work with a view towards standardizing manufacturing conditions which apparently have a marked effect on the adsorptive character of the black.

Zinc Oxide, one of the oldest compounding ingredients used, is still used to a considerable extent for activating accelerators and to some extent for reinforcement. Since the use of high power accelerators has increased, it has been found that some grades of Zinc Oxide will act differently with the accelerator than other grades and this has to be carefully watched as it is likely to cause trouble with variation in cure.

A whole paper could be devoted to the behavior of accelerators and the various problems that arise from their use. During the past two years the use of high power accelerators, like Captax, has been greatly extended due to the possibility of obtaining by their use a shorter cure or a lower temperature of cure, or both, and at the same time an improvement in the tire.

Problems with Accelerators

There are two major factory problems encountered in the factory with stocks containing these accelerators; first, scorching or setting up during the milling or calendering, and secondly, air curing or pile curing occurring in stocks stored in the bins or in calendered stocks or fabrics in rolls.

Prevention of scorching or setting up during the mixing or calendering operation simply involves cooling methods efficient enough to keep the temperature of the stock during these operations below approximately 210° F. This is done either by the use of refrigerated water, by special spray cooling devices in the water jackets of mixers and mills, or by the direct addition of water during the mixing or warming up of stock. This addition of water increases considerably the plasticity of the stock but has not been found to injure the physical properties.

There are many other problems which come up in a rubber factory due to variation in materials used but time will only permit of the few instances mentioned. Altogether, the rubber chemist or factory manager has no cause to complain of monotony in his business.

DISCUSSION

Mr. Amit, Mechanical Rubber Co.: In the first place, Mr. Underwood states he finds a variation in the rubber as it comes from

*Paper given before the Chicago Rubber Group, October 25th, 1929.

the plantation. However, I believe if you get the rubber from the same plantation, there will not be the variation that he speaks of.

Mr. Underwood, Ajax Rub. Co.: Yes, that is true. When receiving a lot of twenty tons of rubber which may come from a half dozen different plantations, having as many different methods of preparing the rubber into sheet form, there is a variation.

Mr. Douglas Johnstone, J. A. Kendall: Mr. Underwood states that it is necessary to cool rubber down below 210°. We find that rubber mixed at 120° to 130° will set up in a pile,

Mr. Underwood: I probably misstated that point. The temperature during mixing or calendering should not run up over 210° to eliminate danger of scorching. But when storing, curing may occur even at room temperature.

Mr. Urech, Inland Tire Co.: We have probably done as much work as any of the rubber companies on variations. We find that a slight variation in the grade of fabric causes variation at calendering and cutting machines, more so than by those caused by temperature variation. The thing to do is to try to eliminate variation in the tension of the picks (filler threads). Fisk and Goodyear have eliminated variation and are cutting fabric very accurately with a machine now on the market which eliminates variation in the tension of the picks (filler threads).

Mr. Amit: Do you mean that if you use Carbon Blacks interchangeably from one company to another you find a variation?

Mr. Underwood: It seems more of a question of locality than of manufacture; namely, certain carbon blacks produced in certain localities work better with D. P. G. than blacks from other districts, etc. We find that Wyoming blacks do not work as well with accelerators of the condensation type, as those obtained from Texas and Louisiana, etc.

Mr. Armit: Have you anything to say on variation in reclaimed rubber?

Mr. Underwood: I think reclaiming will be discussed more in detail later. The only variation that I have found in reclaim has been a variation in the plasticity of the stocks containing it, and consequently in the blooming out tendency or tacky quality. I have not noticed any change in reclaims as to rate of cure.

Dr. Frick, Van Cleef Bros.: Is the Williams plastometer widely used in the factory control of the plasticity of stocks?

Mr. Underwood: You probably know that very few plants are using William's plastometers. Most of them are using a method which roughly consists of having a gauge of the Randall and Stickney type in an electric oven, with a weight on the gauge so that it bears pressure under weight of gauge. There is no absolute value that you get from the Williams plastometer. There is a comparison with a standard which has been set up.

Mr. Kirschner, Dryden Rub. Co.: I would like to ask Mr. Underwood if he has any suggestions to make as to why different grades of zinc oxide give different rates of cure.

Mr. Underwood: I am not able to give the reason. My opinion is that it is not due to particle size but to impurities. We know there is a difference but I am unable to tell why.

Mr. Bartle, DuPont Co.: In answer to Mr. Kirschner's question. We know it is a fact that zinc oxide which contains traces of lead is detrimental to certain accelerators.

Dr. Winkelmann, Philadelphia Rub. Works: Plasticity is measured by the flow of the compound under a given load at a given temperature. Very often different mixes of a compound will show the same degree of plasticity and yet will show wide variations in tubing speeds. It is therefore, very essential that the recovery of the compound should also be measured after determining the plasticity. Recovery measurements will indicate differences in nerve and processing condition which cannot be obtained by making only plasticity measurements.

Extra copies of the Index to Volume 26 of THE RUBBER AGE may be secured upon request. It is printed as Section II of this issue.

Rubber Dispersed Colors

THE rapidly growing demand for colors of unusual brightness, fastness to light and permanence under all curing conditions caused at least one dyestuffs manufacturer to undertake, several years ago, an extensive research study on the problem of coloring rubber with brilliant organic colors. This research investigation has led to the use of classes of colors which were heretofore unavailable for that purpose and has resulted in the development of a quite novel means of incorporating colors with rubber. We have reference to the so-called rubber dispersed colors.

The manufacturer[1] explains this development as follows: "Inorganic colors such as iron oxide and ultramarine blue have been used for coloring rubber since the early days of the industry, but recently there has developed a demand for the more brilliant shades that are obtainable only by the use of organic colors. When this demand first arose, rubber manufacturers naturally turned to the insoluble pigment lakes and toners which had been developed primarily for printing inks and for coloring paper, linoleum, etc. Colors of this class are made by treating dyestuffs with precipitating agents, thus rendering them insoluble in water. They are only partially satisfactory for rubber goods because they do not disperse readily in rubber. Fine grinding alone does not insure good dispersion because most organic colors have a tendency to "pack" on the rolls and may agglomerate during the mixing process, regardless of how finely they may be ground. Of even greater importance is the fact that the sulfur and vat dyes are not adapted to the production of lakes and toners, yet it is these newer types of dyes that have the greatest fastness to light and heat and are chemically the most inert."

The process of making rubber dispersed colors was developed primarily for the purpose of making possible the use of vat dyes. This is the class of dyes that is being used on the new branded cotton goods of guaranteed light fastness which are rapidly replacing the cheaper types of colors, especially for wash fabrics. The older types of pigment colors can also be dispersed in rubber by the same process, making the particle size much smaller and consequently improving the covering power and brightness. Details of the process by which rubber dispersed colors are manufactured have not been made public but it understood that the colors are passed through a colloid mill which reduces the particle size to sub-microscopic dimensions and that the colloidal suspension of color is treated with rubber latex and subsequently milled in such a manner that the latex forms a protective film around each particle of color and prevents agglomeration.

Many of the vat dyes that are now being dispersed in rubber by this process are sufficiently unaffected by prolonged vulcanization that they may be used for the production of colored hard rubber.[2] Most of them are so inert that they may be used in open steam cures without decomposition. This is of importance because one of the greatest shortcomings of the previously used types of organic colors has been their inability to withstand open steam cures. It should, of course, be understood that the ability of certain rubber dispersed colors to withstand sunlight, open steam curing, hard rubber vulcanization and other adverse conditions is not due to the process of rubber dispersion but is, rather, due to the fact that this process makes it feasible to use colors which cannot be satisfactorily milled into rubber in the ordinary manner and hence have heretofore been unavailable for use in rubber.

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[1] E. I. duPont de Nemours & Co., Inc., bulletin on "Rubber Dispersed Colors."

[2] E. I. duPont de Nemours & Co., Inc., Lab. Report 136—"Colors for Hard Rubber."

Schaphorst's CHATS *with the* ENGINEER

By W. F. SCHAPHORST, M.E.

Reducing Noise in Rubber Plant Machinery

SOMETIMES the vibration of rubber plant machinery causes much undesirable noise and distress, and the question is asked: "How can we stop this vibration?"

One concern decided that the best thing to do was to lay a heavy foundation under the machine—so heavy that the comparatively small machine would be unable to cause the heavy mass to vibrate with the machine. This machine was on a second floor. The heavy foundation installed was made of lead. The method "worked" but there are two objections to that method. First, it is an expensive method. Second, it is sometimes impossible to increase the load on a second floor without adding reinforcing columns underneath. It so happened that in this instance additional columns were not required.

The best method I know of for eliminating vibrations of this sort is the use of cork board. By using cork, vibrations may be eliminated "scientifically." Do not distribute the weight over a large area of cork, however. The area must be restricted so that the cork will be under the right amount of compression. Sometimes cork of different densities are used. Sometimes heavy concrete foundations are poured directly on top of cork board, and the sides of the foundation are lined with cork of proper thickness and density. The weight of the foundation plus the weight of the machine are calculated to give the cork the proper amount of compression. Vibration is thereby eliminated.

Cork board is ideal for this purpose because it is strong in compression, is highly elastic, is surprisingly durable, and does not rot. The fact that cork weighs so little per cubic foot is its great advantage for use on second floors.

Do you know why cork is used in preference to other wood for stoppers in bottles? Ninety-nine people out of a hundred don't know. Cork is used principally because it is elastic and because it retains its elasticity. For the same reason cork is the best material for eliminating machinery vibrations. It does not pack down, harden, or lose its resilience. It is permanently strong in structure, is easy to install, inexpensive, and is moisture proof.

Better Grade Spindle Oil Pays

I HAVE before me an interesting report by a concern in the automotive parts manufacturing business. This concern is not what rubber concerns of today would call "big," but they are large enough to do more or less modern research work.

To do modern research work, though, does not necessarily involve the creation of a large department filled with chemicals, glassware, weighing devices, and highbrow scientists. Almost any kind of investigation can in reality be research work. Thus, for example, this automotive concern uses spindle oil for the lubrication of their grinder spindles. They were not certain about the quality of the oil they were using and decided to do some research work. They switched to a lower priced oil which was highly recommended. They kept careful tab on results.

As a result of this investigation they are now back to Oil No. 1.

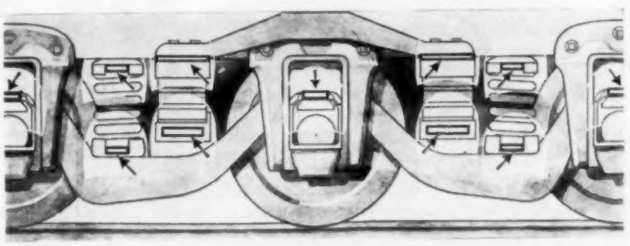
"Rubber Heeling" Railway Cars

THE application of the principle of the shock-absorbing qualities of rubber heels applied to railroad wheels trucks is the latest contribution of the Baltimore and Ohio Raliroad toward the comfort of its passengers.

For about forty years, or since the introduction of the Allen paper steel-tired wheel, there have been no radical changes or definite improvements in trucks for railroad passenger carrying cars. Engineers, and those trained in the art of building and maintaining such equipment, have individually and collectively endeavored to improve the running gear, or trucks of cars, for the purpose of providing greater comfort and more pleasure for those making use of this equipment. The object sought by these men was to provide a softer, smoother, quieter and more soothing ride.

In recent years the use of steel was substituted by railroads for wood in the construction of cars. This change in materials made the task to accomplish these results more difficult, for the reason that the steel provided easier transmission of the metallic sounds from rails and wheels into the car, annoying the passengers more than ever previously experienced.

The Baltimore and Ohio Railroad Company has found methods to solve the problem and to provide better,



Standard Pullman Six-Wheel Trucks Used on Baltimore and Ohio Cars Showing the Positions of the Rubber Pads at the Spring Ends and Wherever Metal Touches Metal

smoother and more pleasant car riding. This was accomplished by rubberizing the running gear or trucks of the cars by inserting more than *one hundred pieces* of pure rubber at various junction points of metal in the construction of the trucks. The results accomplished by the use of this rubber provided an unusually smooth, soothing, soft, quiet, and comfortable ride for passengers, to a degree never enjoyed before. Passengers who are ill, or those inclined to be nervous, riding on railroad trains, will enjoy this improvement as well as those who are well. Nervous passengers have been known to interrupt their trip by leaving the train and taking rests in hotels or with friends due to being unable to withstand the strain of long journeys, caused by the rumbling sound and noise from the steel rails and wheels in steel cars, and due to the need of softness, quietness and restfulness when riding.

These discomforts and annoying conditions have been eliminated by the Baltimore and Ohio from its cars by the use of pure rubber pads. This was accomplished by the rubber pads being placed at the ends of each elliptic spring; on top and at the bottom of each equalizer spring; on top of each journal box under each equalizer foot; under the center plates; under the bearings of the center truck bolster on top of the cross bolster, and under the side bearings. The rubber under the ends of the elliptic springs made it possible for the springs to be made so the main plate would be approximately straight throughout its length, insuring absorption of the shock or jolt from the track, switches, frogs, crossings and joints of the rail.

EDITORIAL COMMENT

The Ten-Ton Contract

TRADING in the new 10-ton contract on the Rubber Exchange of New York started off with a bang and it looks very likely that its popularity will far exceed that of the old "A" contract. The old contract provided for the delivery of off-grades of crude rubber at periodically fixed price differentials. As a result the Exchange became more and more a dumping ground for off-grades. Moreover, a buyer of a distant position never knew until a few days before the month of delivery what discount would be allowed should off-grade rubber be tendered on his contract. The new No. 1 Standard Contract calls for delivery of only "certified" No. 1 quality standard ribbed smoked sheets. The seller has the option of delivering a superior quality but never an inferior grade. The rubber is certified against standard samples by licensed samplers of the Exchange.

The unit of delivery on the new contract will be 10 tons, or 22,400 pounds as compared with only 2½ tons, of 5,600 pounds, on the old contract. The price fluctuations will be 1/100th of a cent per pound, as against 1/10th of a cent on the other contract. Both of these features will make trading more attractive, whether the transaction be of a speculative nature or a normal trading operation. Those engaged in "hedging" operations will also find the precise fluctuations and the larger trading unit of more practical value. Each point of fluctuation in the new contract will represent a value change of $2.24 per contract.

The board of governors of the Exchange have drawn up a very rigid set of rules relative to deliveries, designed to safeguard the rights of purchasers under the new contract. A committee on grading and warehousing and an inspection bureau are charged with maintaining the precise standard of rubber called for. A variation in weight of not over one per cent will be permitted. Should warehouse delivery be desired the rubber can be delivered only from a warehouse licensed by the Rubber Exchange. The tender must be in cases and in one location. Because the rubber is "certified" as to quality it may be re-tendered without any question of a loss being sustained because of a change in differentials incidental to inferior grades. Hedging operations will be simplified for the uncertainty of what may be delivered is removed. All these attractive features of the new contract will make it more popular on the Exchange and should bring about an increase in Exchange trading transactions.

Let's Snap Out of It

THOSE who are well-wishers of the rubber industry would like to see it get genuinely mad at itself, utter some self-propellent oaths and generally settle down to take stock of itself.

In a survey of 57 industries conducted by the National City Bank of New York City, giving the net returns as against the net worth of each industry, the rubber tire manufacturing trade is fourth from the bottom of the list, showing a return of only 3.9 per cent with a total net worth of $621,635,000. Twenty-three tire manufacturing companies are included in the total. Only the wool, coal and Cuban sugar industries show a lower return. What a sad commentary on one of the leading industries of the nation.

There has been demonstratable efficiency in the manufacturing end of the tire industry, output capacity has never been greater, performance per man power and savings by machine operations have never been as high. What is the reason then for this utterly ridiculous and pitifully absurd condition in which the industry continually finds itself financially? Leadership is to blame in a measure, as once stated by F. A. Seiberling, but lack of cooperative effort is more nearly the answer. It is to the shame of the industry that conditions within it exist year after year where companies doing a turnover in sales of hundreds of millions have to fight for a 1 to 5 per cent profit and in many cases end up in taking a loss.

Cooperative efforts in the past have all seemed to fail: witness for instance, the Rubber Institute which started off so auspiciously and with such high purpose. The Rubber Manufacturers' Association has failed to secure the full and cordial support of the entire industry in crucial times and its influence has been passive rather than aggressively helpful.

It seems a pity for the industry to continue splashing around blindly in this quagmire of ill-directed effort when aggressive leadership and constructive cooperation could bring it to a much firmer foundation.

The RUBBER AGE *Published on the 10th and 25th of each month. The Only Twice-a-Month Rubber Publication.*

THE PALMERTON PUBLISHING CO., INC.

Editorial Office, 250 West 57th St., New York City

Telephones: Columbus 2923, 2924

THE RUBBER AGE is published on the 10th and 25th of each month by The Palmerton Publishing Co., Inc., a New York corporation. P. L. Palmerton, President; Earl D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer. Publication Office, 1-3 Peace St., New Brunswick, N. J. Subscription rates: Domestic, $2.00 a year; Canada, $2.50; foreign, $3.00; single copies, up to 3 months old, 20c; over 3 months old, 50c. Advertising rates on application.

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

CHICAGO RUBBER GROUP ON MILLS AND MIXES

About 115 rubber chemists and technologists were present at the meeting of the Chicago Rubber Group of the American Chemical Society, held at Maillard's on March 21. The subject for the meeting was "Milling and Mixing," and the reading of two papers on that topic was followed by informal discussion by the members and by a program of entertainment.

C. F. Schnuck, division engineer of the Farrel-Birmingham Company, Inc., presented a paper on mills and Banbury mixers. He discussed in minute detail the present day construction of roll mills, the type of bearings used, the kind of material used in the rolls, the effect of the thickness of the rolls on the ability to cool the rubber better and the best method of delivering cooling water to the internal surface. He also touched on the mechanics of breaking down rubber and mixing in compounding materials and the losses due to mechanical friction. He explained the action of the Banbury mixer in full and showed the large economies resulting from its use.

Dr. Harlan A. Depew, research chemist of the New Jersey Zinc Company, presented the second paper under the title, "The Behavior of the Pigments During Mixing and Curing." Dr. Depew gave a practical talk on milling and traced the change in the pigments and the rubber during the operations under discussion and also during vulcanization. He illustrated his paper with numerous lantern slides.

Important points were brought out in the discussions that followed each paper. A feature of the entertainment program was the appearance of the Disperso Boys, black face singers.

NEW YORK RUBBER CORP. INSURES ITS EMPLOYES

Announcement has been made of the adoption of a group life insurance policy by the New York Rubber Corporation and its affiliated company, The Beebe-Porghesse Corporation, of Beacon, N. Y., for the protection of 203 employes for a total of $242,000. The policy was issued by the Prudential Insurance Company of America.

Each worker receives protection of from $1,000 to $3,000, according to the rank or position held and this insurance is given to them without any cost, the employing organizations assuming the entire expense.

Speed of Goodrich Plane Saves Life of Sick Child

Flying the 200 miles between Jacksonville and Fort Pierce, Fla., in record time, Lee Schoenhair, pilot of the B. F. Goodrich Company plane, Miss Silvertown, probably saved the life of little Johnny Harris, eight-year-old son of J. T. Harris.

Other planes gone, the last train gone and time too precious for automobile transportation, Schoenhair volunteered his plane and services and in an hour and a quarter delivered Dr. T. Z. Cason, Dr. Ralph R. Greene and Miss Mabel Royal, nurse, to the bedside of the youngster who was critically ill of pneumonia.

Firestone Lets Contract

The engineering department of the Firestone Tire & Rubber Company has let a contract for the construction of a sewage disposal plant near the new Firestone clubhouse on Welch Road, Akron, O. The estimated cost of the structure is $5,000, which will be borne entirely by the Firestone firm. It will be in readiness for use when the first unit of the Firestone clubhouse is ready for occupancy, probably about Memorial Day.

U. S. RUBBER COMPANY CURBS FOOTWEAR OUTPUT

The rubber footwear divisions of the United States Rubber Company at Naugatuck, Conn., began operation on a four-day schedule during the first week in April. The order, which affects approximately 1,500 operators, is expected to be in effect only a short time, Walter H. Norton, manager, said. The footwear divisions were previously on a five-day schedule.

In the notice of the change, posted in the plant and sent from headquarters in New York, it was stated that present business conditions did not "warrant our piling up stock at the present rate and that it will be necessary for us to face a temporary curtailment in production."

The Beacon Falls Rubber Shoe Company, subsidiary of the United States Rubber Company, is moving its plant into Naugatuck and it is expected that operations will begin early in June. All tennis shoes now made in Beacon Falls will be made in Naugatuck, and the entire output is expected to be increased from 30,000 pairs to 50,000 pairs daily.

BEDFORD TIRE & RUBBER WILL RESUME OPERATIONS

Plans worked out by directors of the Bedford Tire & Rubber Company for placing the business on a sound financial basis and for the re-opening of the factory were adopted without a dissenting vote at a meeting of stockholders held March 27 at the plant at Bedford, Va. Colonel William R. Phelps, president of the company, stated that the company owed almost nothing and has holdings estimated at approximately $300,000.

While it could not be definitely stated when the plant will resume operations, it is thought that several months will be required for the working out of preliminary plans. E. N. Downes, of Charlotte, N. C., who has had wide experience in the manufacture of tires, has been proposed as superintendent of the factory.

FIRESTONE TRADE SALES HEADED BY FAIRBANK

The promotion of L. G. Fairbank as manager of trade sales was announced March 26 by officials of the Firestone Tire & Rubber Company. Mr. Fairbank has been manager of the Firestone truck and bus sales department and has been connected with the company for 16 years, prior to which he successfully operated a brokerage business in coal and iron at Cleveland.

He started in the advertising department of the Firestone company, later becoming assistant manager, and then went to the sales department, becoming manager of the eastern half of the sales territory. Mr. Fairbank served as manager of manufacturers' sales and as vice-president and manager of the Firestone Steel Products Company, and during the reconstruction period following the world war was called back to the sales department. Later he was appointed truck and bus sales manager.

Mr. Fairbank is known in the industry throughout the country because he has covered the country in his previous advertising, trade sales and other duties. He resides in Akron with Mrs. Fairbank and their son, Robert, a student at Dartmouth College, and daughter, Betty.

Harshaw Chemical Moves

The Harshaw Chemical Company has moved its executive and sales offices to 1945 East 97th Street, Cleveland, O. The company was formerly located in the Hanna Building of that city.

Francis A. Lasher

Francis A. Lasher, president and manager of the H. N. Richards Chemical Company, Trenton, N. J., died at his home in that city on March 10 after an extended illness. Mr. Lasher, who was 46 years old, was formerly purchasing agent for the Acme Rubber Manufacturing Company, Trenton, N. J.

Survivors are his wife, Mrs. Cornelia A. Lasher; one daughter, Miss Elizabeth Lasher; and his mother, Mrs. Mary H. Lasher. The burial was at the Ewing Church Cemetery in Trenton.

Mr. Lasher was a past master of Ashlar Lodge, F. & A. M., and a member of Scottish Rite and the Mystic Shrine. He also held the 32nd degree of Masonry and took an active part in the work of the order, being one of the leaders in the movement which built the new Masonic Temple in Trenton.

F. J. Smith

The body of F. J. Smith, former president of the Roxana Rubber Company, Akron, O., who disappeared from that city in early February, was found near some woodland in Edinburgh township on March 15. It was thought that death had occurred several weeks previously from the appearance of the body, which was partially frozen. The Roxana Rubber Company went into bankruptcy about two years ago.

Wooster Rubber Display

The Wooster Rubber Company, Wooster, O., entered an exhibit in the second annual "Open House" which was held by the chemistry department on March 8. Nearly 100 industrial and commercial lrms sent exhibits of raw materials, finished products, and explanations of the chemical and other reactions involved in the manufacturing processes.

U. S. RUBBER COMPANY CONFERENCE AT DETROIT

The annual conference between field representatives of the technical service division of the United States Rubber Company and home office officials was recently concluded at Detroit headquarters of the U. S. Tire department.

The conference, which lasted for one week at Detroit, was under the active direction of A. K. Dill, technical service manager, and his staff. Every phase of work affecting this division was gone into at length, and open discussions featured the various business sessions.

Particular stress fell upon the various subjects treated in the new U. S. Heavy Service Tire Manual and Changeover Guide, which was recently compiled by Mr. Dill's division.

At conclusion of the six-day conference at Detroit plant, Mr. Dill took his field men to Indianapolis to the G. & J. Tire Company plant, a subsidiary of the United States Rubber company, where two additional days were spent acquainting the field men with the new processes and developments in the manufacture of tubes, airplane, bicycle and carriage tires.

Ames Dial Micrometer

The B. C. Ames Company, Waltham, Mass., has introduced a new dial micrometer, on which each thousandth of an inch is amplified to easily readable size. This gage can be used for measuring and testing round, flat or odd shaped machine parts, tools, round or flat stock, rubber, textiles,

automotive parts, cardboard, paper, etc. It is of strong, rugged construction yet extremely sensitive.

A quick acting spring spindle is lifted by a simple upward movement of the thumb. It closes itself into position on the work to be measured and the reading is indicated instantly on the face of the dial. The reading can be locked in position by means of a simple snap and the instrument used for testing as a snap gage for one-inch capacity.

Firestone Common Dividend

The Firestone Tire & Rubber Company has declared the regular quarterly dividend of 40 cents a share on the outstanding common stock. The dividend is payable April 21 to stock of record at the close of business on April 4.

PACIFIC DIRIGIBLE LINE IS STILL INDEFINITE

Plans of the Goodyear-Zeppelin Corporation and associated companies for a mail and passenger airship route between Honolulu and California still remain with nothing definite accomplished, according to recent reports. Considerable data has been collected regarding the most suitable location for a mooring mast but no decision made, and the one mast near Honolulu has been declared unsuitable by Goodyear-Zeppelin experts. This was built by the Navy at Ewa for naval maneuvers, but was never used.

It is doubted that any announcement will be made regarding the next step in the development of the plan until satisfactory arrangements for a mail contract have been obtained. The last announcement in this respect was a statement by the Postmaster General that the demands of the backers of the project were exorbitant and hence not feasible from the standpoint of the mail service.

REPUBLIC RUBBER PLANT INSTALLS NEW EQUIPMENT

The Republic Rubber Company, Youngstown, O., has just finished the installation of a new 60 inch by 30 foot Farrel press, the platens of which are solid steel, drilled for steam circulation. It is equipped with two rows of 12 hydraulic rams which operate under 2,000 pounds hydraulic pressure per square inch, giving a total pressure of 738,912 pounds on the platens.

The platens are fitted with water-cooled ends and have accurately ground surfaces, making it thoroughly modern as equipment for the curing of sheet products. The total weight of the press is 340,000 pounds. This press, together with all hydraulic presses and vulcanizers used in the packing department, were installed in the room formerly used for the making of molded goods, which, of course, necessitated the moving of the molded goods presses to new quarters.

The complete renovation of these rooms, together with careful going over of the equipment, has been done with the idea of increasing efficiency in handling products and of caring for the steady increase in volume of business.

Century Tire Receivers

General Abel Davis and Charles Venn have been appointed receivers for the Century Tire & Rubber Company, Chicago, Ill., which was placed in federal receivership on January 28. The factory of the company is not being operated at the present time.

Mohawk Preferred Dividend

The Mohawk Rubber Company on April 1 paid its regular quarterly dividend of $1.75 a share on the company's outstanding preferred stock. The dividend was paid to all stockholders of record as of the close of business on March 28.

Rubber Stocks Make Gains

Led by Goodyear, Goodrich and United States Rubber, the stock issues of the leading rubber manufacturers mounted to new highs during the past fortnight. Norwalk Tire & Rubber common was unusually active at twice its price of two weeks ago. Prices of leading rubber company shares on April 3 compare as follows:

	Last Price Apr. 3	Mar. 19	High —1930—	Low
Ajax	2⅜	2⅛	2½	1⅜
Falls	—	—	4¾	3
Faultless	—	—	37	34⅜
Firestone	28⅞	27½	33⅛	26
do. 6% pfd.	—	85	86⅝	79¾
Fisk	5	3⅝	5½	3
do. 1st pfd.	19	16	21	13
General	—	—	160	135½
do. pfd.	90	—	91	88½
Goodrich	54¼	48¾	58½	40¼
do. pfd.	—	103	108½	95⅝
Goodyear	91½	91⅛	96⅞	62
do. 1st pfd.	—	100	100⅞	90
India	19	—	18	8½
Intercontinental	—	—	6⅜	4¼
Kelly Springfield	5	4⅞	5⅝	3¼
do. 6% pfd.	—	—	39	29
Lee	—	8⅞	9	6¼
Miller	5⅛	4¼	5⅝	3⅞
do. pfd.	—	34½	34½	18
Mohawk	—	10½	14	8½
do. pfd.	—	—	55	50
Norwalk	2½	1½	4	⅞
Pirelli	—	—	50¼	45
Raybestos-Manhattan	47	39	48⅝	33
Seiberling	14	12½	18½	10¼
do. pfd.	—	52	78	50
U. S. Rubber	32⅞	28⅜	34¼	21⅛
do. pfd.	62	55	63⅝	47¾

Names in the News

H. J. COLLIER, who resigned from the B. F. Goodrich Company after 20 years' service, has accepted a position in the construction and development division of the United States Rubber Company with headquarters at Detroit, Mich. Mr. Collier was engaged in foreign development of the B. F. Goodrich Company and assisted in starting a number of that company's foreign plants.

PAUL DIETZ, factory representative of the B. F. Goodrich Company at Mexico City, visited his home at Lorain, O., last month before leaving to take up his duties in his new post at the Mexican capital.

C. M. HAMMOND has been appointed by the United States Rubber Company as assistant advertising manager of the tire department, according to an announcement by G.

C. M. HAMMOND

N. WALKER, advertising manager. He was recently in charge of dealers' co-operative advertising and sales promotion and previous to that was regional sales promotion manager for the Chevrolet Motor Company. Mr. Hammond, a native of Detroit, educated in the schools of Michigan, has been connected with the automotive industry for the past ten years.

EARLE V. HENNECKE, formerly vice-president of the Cooper Corporation, Findlay, O., has organized and is president of Automotive Alliance, Inc., a group of jobbers formed for purposes of co-operative buying.

R. A. JOHNSON, in charge of the statistical department of the tire control division of the United States Rubber Company, completed 30 years with that organization on April 1. Tire department employes held an informal party on that day in his honor.

HOWARD KARG, of the engineering department of the Giant Tire & Rubber Company, Findlay, O., was a speaker on March 13 before the members of the Ohio Northern Section of the American Chemical Society at Findlay College. His subject was "Some Chemical Aspects of Tire Manufacture," and he was assisted by RAYMOND HYBARGER, chemist of the tire company.

BRUCE BEDFORD, president of the Luzerne Rubber Company, Trenton, N. J., left with his family for Jacksonville, Fla., and Nassau in the Bahamas to spend several weeks.

ROBERT J. STOKES, president of the Thermoid Company, Trenton, N. J., has been elected to the board of directors of Mercer Hospital in that city.

ROBERT R. SHAW has been appointed by the United States Rubber Company as service supervisor of motor coach and cab tire sales. He has been engaged in the automobile and tire industry for the past 12 years.

PHIL J. KELLY, advertising manager of the B. F. Goodrich Company, spoke at a luncheon meeting of the Advertising Council of the Chicago Association of Commerce on March 20.

FRED GUINTER, foreman at the plant of the American Hard Rubber Company at Akron, O., retired from that company last month after 43 years of service. A ceremony in his honor was planned by WALTER E. JOHNSON, factory superintendent, and he was presented with a smoking set and a purse.

COMMANDER JEROME C. HUNSAKER, vice-president of the Goodyear-Zeppelin Corporation, was a member of the party that accompanied DR. HUGO ECKENER, commander of the *Graf Zeppelin*, to Washington, D. C., where he was presented with the special gold medal of the National Geographic Society.

DAVID D. PORTER, formerly of the credit department of the Firestone Tire & Rubber Company at Kansas City, Mo., is a candidate for the Republican nomination for prosecuting attorney of Medina County, Ohio.

MATT J. HEROLD has been appointed by the United States Rubber Company as special representative of the motor coach and cab tire sales division in the northwest region with headquarters in Chicago, Ill. Mr. Herold is well known in the automotive industry, having been with for the past 10 years, most recently as southeastern division district manager of Graham-Paige Motors.

C. A. KRAUS of Brown University spoke on April 9 before the members of the Akron Section of the American Chemical Society.

CHARLES E. CANNON, personnel manager of the Goodyear Tire & Rubber Company, has been awarded a 20-year service pin. He joined the company in February, 1910.

J. E. HICKS has been appointed by the United States Rubber Company as district manager of tire sales at Baltimore, Md. J. R. McCOY has been named as district manager of tire sales at Philadelphia, Pa.

HARRY CONROY, chief chemist of the General Tire & Rubber Company, spoke on the manufacture and use of tires before the members of the Lions' Club of Canton, O., on February 26.

FRANCIS J. CONWAY has returned to Akron after two years at the Liberia concession of the Firestone Plantations Company. He returned to the United States by way of Paris and London.

WILLIAM O. CUTTER, a director, member of the executive committee, and vice-presi-

W. O. CUTTER

dent of the United States Rubber Company, has tendered his resignation and sailed on March 28 for an extended trip abroad for rest and recreation. Mr. Cutter, who was for a number of years comptroller of the company, had been associated with the United States Rubber organization in various capacities in the departments of accounts and finance for more than 14 years.

PHILIP H. BRANDT became a general partner in the firm of Slaughter, Horne & Company, members of the Rubber Exchange of New York, on April 1.

R. S. WILSON, vice-president and sales manager of the Goodyear Tire & Rubber Company, spoke on March 29 at the final employes' night meeting of the company for the 1929-30 season. The subject of his talk was "Employe Salesmanship."

DR. A. A. SOMERVILLE, of the R. T. Vanderbilt Company, New York City, is to sail April 22 on the Berengaria for a European business tour during which he will visit eight countries. He will speak before the Birmingham Section of the Institution of the Rubber Industry on May 1 and before the London Section on May 5 on "Some New Developments in the Physical Testing of Rubber."

Rubber News Around the World

ORGANIZE NEW SECTION OF RUBBER INSTITUTION

The newly formed West of England Section of the Institution of the Rubber Industry has been completely organized and has elected officers and a commitee. Plans for this new section were first definitely announced at a meeting last November at Trowbridge after rubber chemists and technologists in that vicinity had pointed out that the nearest section at London was 90 miles away.

Sir Herbert Blain, C.B.E., M.Inst.T., vice-chairman of the Avon India Rubber Company, Ltd., was elected chairman of the new group, and Dr. S. S. Pickles, chief chemist of George Spencer Moulton & Company, Ltd., was chosen vice-chairman. T. L. Garner, M.Sc., A.I.R.I. (Sc.), of the Avon India Rubber Company, Ltd., was named secretary and treasurer.

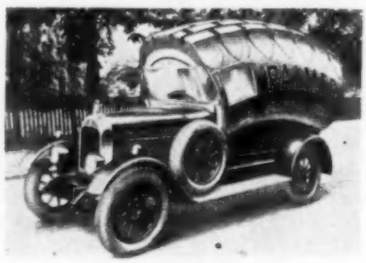
The members of the committee include the following: F. W. Hinde, F.I.R.I., managing director, Avon India Rubber Company, Ltd.; S. L. Hewitt, Avon India Rubber Company, Ltd.; W. C. Holbrook, Trowbridge Rubber Company, Ltd.; A. M. James, South Wales Brattice Cloth & India Rubber Company, Ltd.; C. Kendall Jones, A.I.R.I. (Tech.), Avon India Rubber Company, Ltd.; C. C. P. Lane, Avon India Rubber Company, Ltd.; F. M. Panzetta, A.M.I., Mech.E., M.J.Inst.E., A.I.R.I. (Eng.), Trowbridge Rubber Company, Ltd.; Major C. R. Quartley, George Spencer Moulton & Company, Ltd.; C. Solomon, George Spencer Moulton & Company, Ltd.; F. Webster, Avon India Rubber Company, Ltd.; and J. Smart.

"Ru-bestos" Socks

The "Ru-bestos" sock has been specially designed by an English manufacturer to keep the foot at a normal temperature in summer or winter. It is made of sponge rubber and woven asbestos cloth, and is intended particularly for the use of people whose occupation requires them to be continually upon their feet, either walking or standing.

CATALPO for Treads

An Advertising Delivery Car



One of a fleet of new delivery trucks that are in themselves advertisements of Palmer cord tires is shown above. The body is constructed in the form of the new Palmer five-bar tread casing, and the cars, which are now running through different sections of England, are receiving considerable attention. The manufacturer of Palmer tires is the India Rubber, Gutta Percha & Telegraph Works Company, Ltd., of London and Burton-on-Trent.

Michelin Factory in Germany

The Michelin Rubber Company is reported to be erecting its own factory in Germany at the town of Carlsruhe. The company has already acquired a large area of land in that vicinity.

The office of the International Association for Rubber and Other Cultivations in the Netherlands Indies was moved on April 1 from 38 Heerengracht, The Hague, to 5 Nieuwe Doelenstraat, Amsterdam, C., Holland.

Goodyear Aide Kills Tiger, Saving Himself from Death

A lucky shot by A. Schluter, an assistant at Dolok Merangir, the oldest Goodyear Tire & Rubber Company plantation in Sumatra, killed a wounded tiger that had charged him and probably saved him from death or severe injury. It was the first tiger that had been killed on the plantation for a long time.

After the animal had killed a horse and a bullock on the estate, G. W. Reijnst, one of the factory assistants, and Schluter awaited the tiger's return in a tree and wounded him in the shoulder. The two followed through the trees, expecting to find the tiger dead a little farther on, but came upon the wounded beast suddenly. Schluter slipped on the soft soil just as the tiger charged, but fired a chance shot as he lay on the ground and luckily stopped the animal just in time.

FIRESTONE OPENS BRIDGE ACROSS THE DU RIVER

The first bridge to span the Du River in the heart of the Firestone Tire & Rubber Company plantation in Liberia was dedicated and opened for public use on April 1. President King of Liberia and other high government officials joined with Firestone executives in the dedication of the bridge.

The bridge is approximately 50 miles north of Monrovia, the capital of the republic. Constructed entirely of steel and concrete, it is 190 feet long and was built in its entirety by Firestone construction experts imported for the job.

NEW ADVERTISING HEAD FOR CANADIAN GOODRICH

According to an announcement by E. S. Sargeant, vice-president and general manager of the Canadian Goodrich Company, Ltd., R. C. Groffman has been appointed advertising manager of that organization. Mr. Groffman has a wide experience in the advertising of Goodrich products, having been one of the company's former district advertising managers. He will be in charge of both tire and footwear advertising at Kitchener, Ont.

J. Walter Thompson Company, Ltd., Montreal, Que., has been designated as advertising agents of the Canadian Goodrich Company, Ltd.

MORE RUBBER ESTATES ABSORBED BY MERGERS

The Klabang Rubber Co. reports the purchase of the Karai Estate for 25,000 shares of £1 each. The estate was taken over as from January 1, 1930, and consists of 516 acres of mature rubber.

The Chersonese (F. M. S.) Estates Co. announces the purchase of the Nellmay Estate for 300,000 shares of 2s. each and £10,000 cash. This estate, an adjoining property, was also taken over as from January 1, and comprises 1,111 acres, 501 of which are planted with rubber.

CATALPO for Frictions

Rubber Goods and Specialties

Hood White Sidewall Casing

The Hood Rubber Products Company, Inc., a subsidiary of the B. F. Goodrich Company, has added a new white sidewall Suprex tire to its line in order to meet the growing demand for casings of this type. In construction it follows very closely the Hood black sidewall Suprex, being built in

6-ply in all sizes. The extra heavy long staple cord fabric, extra rubber coating between plies, heavy carcass, and oversize air chamber are said to assure comfortable riding qualities and long mileage. The same characteristic non-skid design with rugged arrows extending down the sidewall of the tire as found on the entire new line, is used in this casing also. It is built in a complete run of sizes and is expected to be especially popular for large sport model cars.

Oak Onyx Balloon

The Oak Rubber Company, Ravenna, O., which recently introduced the Major Bubbles balloon, is now offering an attractive novelty in its new Onyx balloon — a combination of the company's previous "rainbow" and

mottled effects. In this new number the rainbow stripes, which blend softly into one another, form a background for the variegated or mottled pattern. The effect is very colorful and striking.

Lea Automobile Carpet

A carpet that has its pile set in vulcanized rubber is now being marketed by Lea Fabrics, Inc., 768 Frelinghuysen Avenue, Newark, N. J. This is produced without even spinning or weaving the fibres which form the wearing surface.

A thin layer of rubber (B) is vulcanized to these fibres of the deep pile (C) and also to the backing fabric (A), which is Dundee burlap. According to the manufacturer, this pile can not scuff or ravel and wears longer, while the carpet insulated against heat and cold, absorbs vibration and is cleaned easier.

Rubber Protector

A rubber heel or protector designed by S. E. Andreasson, Gothenburg, Sweden, consists of two or more layers of plantation crepe rubber joined together by adhesive, an outer layer being provided with holes, and washers being placed in register with said holes between the adjacent surfaces of two layers, or the inner layer may be slightly thicker than the outer layer so that the washers may be in the centre after the attaching nails have been driven.

Rubber Springs

In a device patented by S. B. Woolf, London, England, a resilient cushioning member is mounted at its ends between abutments, each provided with a guide, the two guides telescoping one into the other and being located axially within the cushioning member so as to maintain the abutments in alignment. The guiding members may be of the cylinder and piston type or of the plunger type, and each guide may be formed with threaded extensions for attachment to the parts between which the cushioning member is arranged. The end plates may have extensions moulded into the rubber, and the end abutments may be formed with flared extensions partly surrounding the rubber cushion and permitting radial extension only within certain limits. The apparatus may be applied, for example, to the mounting of bumper bars on motor vehicles and to buffers limiting the movements of the vehicle springs.

Sunruco Desk Shoes

Under the name of Sunruco desk shoes, the Sun Rubber Company, Barberton, O., is manufacturing rubber footrests for home and office furniture. These desk shoes are

produced from firm molded rubber, neatly finished, and reinforced with an enameled metal insole that provides extra resistance. The use of these footrests is said to prevent gouging and indenting of linoleums, ugly spotting of rugs, scratching and marring of polished hardwood floors, and skidding on marble or hard composition floors. These desk shoes, brown in color, are made in two sizes in square shape, two in round, and are applied by simply setting the leg of the furniture in the shoe. They are packed in sets of four to the box.

Airubber Kidboat for Children's Water Sports

FOR children's aquatic sports, the New York Rubber Corporation, Beacon, N. Y., is now offering the Airubber Kidboat. This inflatable boat is strongly made to stand long service and is said to be thoroughly safe. It will float a dozen youngsters, and separate air chambers provide double protection. The boat is five feet long, with a 30-inch beam, and weighs only 10 pounds. Its carrying capacity is 150 pounds. If desired, a double paddle can be furnished with the boat.

Current Crude Rubber Items

DUTCH PLANTATION FIRM HAS $1,775,000 PROFIT

The report of the Rubber Plantations Company (Amsterdam) for 1929 states that exploitation profit for the that year amounted to £363,963, or approximately $1,775,000. A dividend of 15 per cent was paid to shareholders.

The rubber crop of Sumatra estates was 15,334,646 pounds and that of the Java estates 1,754,354 pounds, making a total of 17,089,000 pounds. Of this total 16,715,998 pounds were sold at an average of 13.3d per pound net, as against a 1928 average of 13.8d. The cost price f. o. b. port of shipment in India, including bonus to Dutch East Indian staff and the D. E. I. tax was 8.6d per pound, as against 8.7d in the previous year. Besides usual depreciation on buildings, factories, cost of recruiting, inventory, etc., this cost price also includes depreciation on plantations.

The crop for 1930 is estimated at 17,857,000 pounds of rubber. This company also produces large quantities of palm oil, coffee and tea.

COMMITTEES ARE NAMED BY RUBBER EXCHANGE

The following committees have been appointed to serve during April by the Rubber Exchange of New York:

Floor Committee: J. Frank Dunbar, chairman; Arthur L. Dunn, Alfred Croft, Werner S. Hammesfahr and P. V. L. Bouton.

Spot Quotations: Daniel M. Fraser, Jr., chairman; James R. Shannon, G. A. Sullivan.

Quotation Committee: Frank D. Pressinger, chairman; Alfred Croft and Elliot H. Simpson.

The steamship *Biddenijd* is reported as having burned near Port Said with 11,000 cases of rubber.

New Ten-Ton Trading Contract Is Inaugurated on Exchange

TRADING in the new No. 1 Standard rubber futures contract was inaugurated on the Rubber Exchange of New York on Tuesday, April 1, with 130 tons traded in the first hour. There was wide interest shown in the new contract from the very opening, and it has in the first few days of the month surpassed the old "A" contract in volume of tonnage. The first day's results were slightly disappointing, but the following trading sessions have shown that the new unit is coming into popular favor.

The turnover in the new contract on April 1 was 20 contracts, or 200 tons, and the sales in the "A" contract totaled 56 contracts, or 140 tons, making a total volume of 340 tons for both, as compared with 377½ tons for the "A" contract alone on the day previous. It might be said, however, that both the market and commission house representatives stood by to watch, letting some of its ardent supporters take the initial plunge while they sized up its performance at the side of the old contract. They were particularly observing of price differentials, both as between the No. 1 Standard and the "A" terms as well as between the first contract and the actuals outside.

Price Spreads Are Developed

These observers witnessed price spreads of from 15 to 25 points develop on the active months of May, July, September and December in the shape of premiums on the No. 1 Standard over the "A" contract and an average price spread of about 20 points during the later trading. Comparing prices on the No. 1 Standard with the actuals, it was found that the former dipped below the latter at times, but generally kept pace with the standard grade outside. A disinterested watcher at the close, however, stated that the No. 1 Standard prices on the exchange should average at least 5 points premium over the actuals owing to the cost of certificating the rubber.

The course of values for both contracts during the first session was downward, the "A" prices closing 10 to 20 points below net lower, while those on the new contract wound up from 7 to 28 points below their earlier highs. Trading in the No. 1 Standard started with the opening call, William D. Paul buying for his own account one lot of May delivery from Edison S. Lenhart of Herron, Rodenbough & Meyer at the price of 16 cents. Paul then sold December delivery to Munds & Winslow at 17.40 cents. Bids and offers on July and September were 5 points apart at the start.

In trading which followed, May slipped from 15.95 cents during the first hour to 15.82 cents at noon, July from 16.44 cents at the start to 16.30 cents in the last hour, September from 16.73 cents to 16.68 cents, while December was transacted only during the first hour at 17.36 cents and 17.30 cents. The one-point "cotton" fluctuations were a novelty to the floor brokers, but favorably commented upon. In summary the new contract was well received and widely praised in all quarters, and many representatives in the trade forecast a large volume in it to the eventual exclusion of the older terms.

More Active on Second Day

The volume of trade in crude rubber futures on Wednesday, April 2, was more than double that of the first day of the new contract, with particular attention being paid to the No. 1 Standard terms. The new trading unit commanded more outside attention and sales mounted to 500 tons as against the 200 tons of the first day, while the turnover on the "A" contract totaled 360 tons against 140 the day before. Premiums on the No. 1 Standard were higher at from 21 to 26 points above the active "A" deliveries.

Closing Prices on Rubber Exchange of New York, Inc.

FROM MARCH 19 TO APRIL 3, 1930

		Spot	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Sales
"A" Contract of 2½ Tons															
Mar.	19	15.00	15.00	15.30	15.50	15.80	16.00	16.20	16.40	16.50	16.60	16.80	17.00	——	54
	20	15.10	15.20	15.50	15.70	16.00	16.20	16.40	16.60	16.70	16.90	17.10	17.30	——	251
	21	15.40	15.40	15.70	15.90	16.20	16.40	16.70	16.90	17.00	17.10	17.30	17.50	——	349
	22	15.50	15.40	15.60	15.80	16.10	16.30	16.60	16.80	16.90	17.00	17.20	17.40	——	43
	24	15.60	15.50	15.80	16.00	16.30	16.50	16.80	17.00	17.10	17.20	17.40	17.60	——	241
	25	15.50	15.50	15.80	16.00	16.30	16.50	16.70	16.90	17.00	17.10	17.30	17.50	——	118
	26	15.40	15.20	15.50	15.70	16.10	16.20	16.40	16.60	16.70	16.80	17.00	17.20	——	136
	27	15.30	15.20	15.50	15.70	16.00	16.20	16.40	16.60	16.70	16.80	17.00	17.20	——	132
	28	15.60	15.50	15.80	16.00	16.30	16.50	16.70	16.90	17.00	17.10	17.30	17.50	——	138
	29	15.70	15.50	15.90	16.10	16.30	16.50	16.80	17.00	17.10	17.20	17.40	17.60	——	105
	31	15.60	15.50	15.70	15.90	16.20	16.40	16.60	16.80	17.00	17.20	17.40	17.60	——	151
Apr.	1	15.40	15.30	15.50	15.70	16.10	16.30	16.50	16.70	16.90	17.10	17.30	17.50	17.70	56
	2	15.40	15.30	15.50	15.70	16.00	16.20	16.40	16.60	16.70	16.90	17.10	17.30	17.50	144
	3	15.40	15.30	15.40	15.70	16.00	16.20	16.40	16.60	16.70	16.90	17.10	17.30	17.50	100
Standard No. 1 Contract of 10 Tons															
April	1	——	——	15.72	15.93	16.29	16.48	16.68	16.85	17.02	17.19	17.36	17.53	17.69	20
	2	——	——	15.71	15.97	16.24	16.45	16.66	16.82	16.97	17.13	17.36	17.56	17.76	50
	3	——	——	15.66	15.92	16.20	16.38	16.56	16.74	16.90	17.05	17.25	17.45	17.65	13

CATALPO
for
Mechanicals

GOODYEAR BUILDS BLIMP TO REPLACE "PURITAN"

Construction has been started on a non-rigid airship to be launched this spring for the Goodyear Tire & Rubber Company. Although the new ship is to take the place of the old "Puritan," which was wrecked on January 11 and will use the motors and carriage of the old ship, an entire new envelope is being constructed which makes it eligible to be called a new ship. The new "Puritan" will be the same size as the old one, being 143 feet long wtih 96,000 cubic feet of gas, making it second in size among Goodyear's fleet of six, only the "Defender" being larger.

Goodyear also has an order for the construction of a ship the size of the "Vigilant" containing 86,000 cubic feet for Arthur G. Wadsworth Company, Dartmouth, Mass. The ship is being purchased in conjunction with a group of Fall River and New Bedford business men. Construction on this ship will start shortly, and delivery is expected early in the spring.

The building of the new "Puritan" marks the 127th non-rigid airship manufactured by Goodyear.

Rubber & Celluloid Officers

The Rubber & Celluloid Products Company, Newark, N. J., owners of the Rubberset Company, have elected new officers for the current year. Mrs. E. A. Spurr has been named as president, and the other officers include H. G. Russell, vice-president and general manager; J. H. Galloway, vice-president and general sales manager; T. B. Denton, vice-president in charge of operations; W. R. Wright, vice-president in charge of sales; Frank Fedderson, treasurer; and J. S. Hays secretary.

To Open Merchandise Mart

The Merchandise Mart at Chicago, Ill., the world's largest building, will be opened on May 1. More than 600 manufacturers of merchandise are already represented in the list of tenants. Special floors are being assigned to manufacturers of related lines, and the eleventh floor is reserved for rubber goods, fancy goods, toilet articles, notions, umbrellas and canes.

Ajax on Full-Time Schedule

The Ajax Rubber Company, Racine, Wis., resumed full-time manufacturing operations on tires and tubes on March 24, giving employment to about 300 workers. H. W. Roland, plant manager, has declared that the company's business has shown great improvement and stability.

Columbia Plant Is Sold

All the equipment and part of the buildings of the Columbia Tire & Rubber Company, Mansfield, O., were sold on March 26 by the Industrial Plants Corporation, New York City. The greater part of the plant was purchased by C. F. Michaels of Bucyrus, O., who has not indicated the purpose to which he will put the buildings.

Airport Named for Goodrich

Because of the liberal gift of James D. Tew, president of the B. F. Goodrich Company, which made the new airport at Vero Beach, Fla., a possibility, citizens of that community have voted to name the airport "Silvertown" after the Goodrich company's "Miss Silvertown" plane. Mr. Tew broadcasted a brief address at the opening of the airport.

Safety Congress at Pittsburgh

The annual Safety Congress for 1930 held under the auspices of the National Safety Council, will be at Pittsburgh, Pa., from September 29 to October 4. The William Penn and Fort Pitt Hotels in that city will be meeting headquarters. An elaborate program is being developed by members of the Rubber Section.

U. S. Rubber Sells Building

William Randolph Hearst in the name of the Apperson Realty Corporation, has acquired from the United States Rubber Company the two-story building at 232 West 58th street, New York City, adjoining the twenty-story home of the rubber company at 1790 Broadway. Mr. Hearst, who is the owner of several other parcels of real estate in the Columbus Circle district of New York City, made the purchase with certain restrictions to assure the United States Rubber Company that its light will not be cut off.

Kelly-Springfield Position

M. C. Lochenbruch, auditor of the Kelly-Springfield Tire Company, has sent a letter to dealers pointing out the excellent financial condition in which the company closed 1929. Current assets were 16.2 times current liabilities. Cash alone equalled 2.17 times total current liabilities, and current assets were equal to 16.2 times total debt, owing to the fact that Kelly retired its last funded obligation last year. For each dollar of net worth of the company, Kelly had only 3 cents of total debt. It is pointed out that the company's plant at Cumberland, Md., showed a total cost on December 31, 1929, of $16,500,000 and is carried on the books at $7,000,000, the difference of $8,800,000 having been depreciated since 1921.

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CUSHION TIRES LISTED AS SOLIDS IN ILLINOIS

Cushion tires must be classified under the Illinois motor vehicle law as "solid rubber" tires, as distinguished from pneumatic tires, according to an opinion by the attorney general, Oscar E. Carlstrom. The Illinois law provides that vehicles equipped with pneumatic tires and which weigh between 12,000 and 15,000 pounds, including load, if designed to carry passengers, may travel over the highways at a speed of 40 miles an hour, and if designed to carry freight they may travel 25 miles an hour, whereas in either case, if equipped with solid rubber tires, the speed is limited to 12 miles an hour.

"No special provision is made for cushion tires," the attorney general says, "hence it would appear that the legislature has provided that tires fall into one or the other of the classifications, viz.: They are either pneumatic tires or solid rubber tires. I am of the opinion that inasmuch as the tires in question are not of the pneumatic type, they must be considered as of the solid rubber type."

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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, APRIL 5, 1930

RUBBER

Crude

NOT since 1928 has there been a month during which the price of crude rubber remained more stable than in March. Last month the closing spot quotations for ribbed smoked sheets on the New York outside market fluctuated only over a range of three-quarters of a cent. From a low of 15 cents a pound on March 5, the price rallied to a high of 15¾ cents on March 28 and 29 and on nearly half the trading days of the month stood firmly at the approximate average of 15⅛ cents.

The actual average of the daily closing prices in March was 15.34 cents a pound, as compared with 15.85 cents in February and with 24.55 cents in March, 1929, the peak month of last year. Thus far in April the commodity has shown no signs of deviating from the price range established in March. Announcements of more plantation groups pledging adherence to the May tapping vacation have followed one another almost daily, but have had no effect in rallying the price quotations.

Prices quoted on the New York outside market on April 5 were as follows:

Plantations—

Ribbed Smoked Sheets—		
Spot-Apr.	.15⅛@	.15⅜
May-June	.15⅝@	.15⅝
July-Sept.	.16 @	.16⅜
First Latex, crepe spot	.15¼@	.15½
Amber Crepe, No. 2	.14¼@	.14⅜
Amber Crepe, No. 3	.13⅞@	.14⅛
Amber Crepe, No. 4	.13⅝@	.13⅝
Brown Crepe, Clean thin	.13⅝@	.14⅛
Brown Crepe, specky	.13⅜@	.13¾
Liquid Latex, per gal.	.90 @	

Paras—

Up-river Fine	.16½@	—
Up-river Medium	Nominal	
Up-river Coarse	.07¾@	—
Acre Bolivian, fine	.17 @	—
Caucho Ball, Upper	.08 @	—
Islands, fine	Nominal	

Centrals—

Central, scrap	.08¼@	—
Esmeraldas	.08¼@	—

Balata—

Block, Colombia	Nominal	
Block, Ciudad	.40 @	.41

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers		
Spot-Apr.	@	7½d
May-June	@	7⅝d
July-Sept.	@	7⅞d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers		
Spot	7⅛@	7⅛d

Scrap

The demand from reclaimers is already showing the increase that was looked for with the beginning of spring, but is still far from the high levels of last year. Collections are becoming slightly better, and the latest price quotations, which show little change, are as follows:

(Prices to Consumer)

Auto tire peelings	ton	32.50	@34.00
Standard White auto	ton	40.00	@45.00
Mixed auto	ton	20.00	@21.00
Bicycle tires	ton	17.50	@19.00
Clean solid truck tires	ton	24.50	@25.00
Boots and shoes	cwt.	1.38	@ 1.40
Arctics, untrimmed	lb.	.00⅞@	.01
Inner tubes, No. 1	lb.	.07¼@	.07½
Inner tubes, No. 2, compounded	lb.	.03⅞@	.03⅞
Inner Tubes, Red	lb.	.03⅞@	.04
Air Brake Hose	ton	20.00	@22.50
Rubber Hose	ton	17.50	@20.00

Reclaimed

Consumption of reclaimed rubber during February was 14,559 long tons, based on an estimate of the Rubber Manufacturers' Association report as being 74.8 per cent correct. Production during the period was 15,846 long tons and stocks on hand at the close of the month were 24,243 long tons. The latest price quotations were as follows:

High Tensile

Super-Reclaim No. 1 Black	lb.	.11¾@	.12
High Tensile Red	lb.	.10¾@	.11

Shoe

Unwashed	lb.	.07 @	.07¼
Washed	lb.	.09 @	.09½

Tube

No. 1 (Floating)	lb.	.12 @	.12¼
No. 2 (Compounded)	lb.	.09 @	.09½

Tires

Black	lb.	.07 @	.07¼
Black, selected tires	lb.	.07¼@	.07½
Dark Gray	lb.	.08¼@	.08½
Light Gray	lb.	.09½@	.10
White	lb.	.11 @	.11½
Truck, Heavy Gravity	lb.	.07 @	.07¼
Truck, Light Gravity	lb.	.07¼@	.07½

Miscellaneous

Mechanical blends	lb.	.06 @	.06½
Red	lb.	.10½@	.11

COTTON and FABRICS

Cotton

THE average closing price for spot middling upland cotton during the month of March was 15.13 cents a pound, as compared with 20.19 cents in March, 1929. The price has rallied considerably since the middle of March, however, and in the first days of the current month was at the highest levels attained since last January.

The Co-operative Associations have been buying heavily in the May and July deliveries, particularly the former, and are expected to demand actual delivery on their contracts. This fact, together with the better feeling reported at cotton textile centres, has helped the rally that has brought the commodity back from the 14-cent price level.

The high, low and closing prices on the New York Cotton Exchange an April 15 were as follows:

	High	Low	Close	Close
		Apr. 5		Mar. 19
May	16.53	16.30	16.50	15.44
July	16.56	16.33	16.53	15.48
Oct.	15.85	15.70	15.76	15.37

Tire Fabrics

Tire factories in January used 19,412,217 pounds of cotton fabric. Late closing prices for the various grades follow:

CORD

Peeler, carded, 23/5/3	lb.	.42¼@	.42½
Peeler, carded, 23/4/3	lb.	.44¾@	.45
Peeler, carded, 13/3/3	lb.	.38½@	.39
Peeler, carded, 15/3/3	lb.	.39½@	.40
Egyptian, carded, 23/5/3	lb.	.48¼@	.48½
Egyptian, combed, 23/5/3	lb.	.53 @	.53½

CHAFERS

Carded, American, 8 oz.	lb.	.36½@	.37
Carded, American, 10 oz.	lb.	.37½@	.38
Carded, American, 12 oz.	lb.	.36 @	.37
Carded, American, 14 oz.	lb.	.35 @	.40

LENO BREAKER

Carded, American, 8¼ oz.	lb.	.37 @	.41
Carded, American, 10¼ oz.	lb.	.37 @	.41

SQUARE WOVEN

Carded, American, 17¼ oz. 23-11 ply	lb.	.42½@	.43
Carded, American, 17¼ oz. 10-ply	lb.	.35 @	.35½

Sheetings

The action in the sheetings market has been mixed during the fortnight, but the changes in either direction have been only fractional. Late prices follow:

40-inch, 2.50-yard	yd.	.10¼@	.10⅜
40-inch, 2.85-yard	yd.	— @	.09¼
40-inch, 3.15-yard	yd.	.09⅞@	.10
40-inch, 3.60-yard	yd.	.08⅝@	.08¾
40-inch, 3.75-yard	yd.	.07¾@	.07⅞
40-inch, 4.25-yard	yd.	.06¼@	.06⅜

Ducks

Cotton ducks have shown a decline in price despite the rise in the market for the raw commodity. The latest price quotations were as follows:

Belting and Hose	lb.	.34½@	.35
Enameling	lb.	.32 @	.32½
Single filling	lb.	.14 @	.14½
Double filling	lb.	— @	.16

CHEMICALS

RESUMPTION of higher production schedules by tire factories toward the end of March added further impetus to the demand for rubber chemicals and compounding materials. Carbon black companies found the first quarter of 1930 the poorest in years, owing to the lowered prices and the low rate of operations at tire plants. Better business is expected during coming months, however, with a pick-up both in this country and abroad. Following the recent natural gas merger under Electric Bond & Share interests, the Palmer Gas Products Corporation has indicated its intention of seeking carbon black business from rubber factories on a more extensive scale than previously.

ACCELERATORS

Organic

A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.90 @	.95
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.15 @	.16
Captax	lb.		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.44½
Diphenylguanidine	lb.	.30 @	.32½
Dipsol	lb.	4.30 @	4.50
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.40 @	.42½
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.61
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.75 @	—
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 397	lb.	.75 @	.77½
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermlo F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.25½@	.28½
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.62½
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z 88	lb.	.50 @	.60
Zimate	lb.		

Inorganic

Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08½@	.08¾
Litharge, domestic	lb.	.09¼@	.11
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)

Blues

Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.32

Browns

Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07

Greens

Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb.	.34½@	.35½

Reds

Antimony crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Venetian red	lb.	.03 @	.06
Vermillion, quicksilver, English	lb.	2.00 @	2.05

Whites

Lithopone, Akcolith	lb.	.05 3/5@	.06
Lithopone, Albalith	lb.	.05¼@	.05¾
Lithopone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanox B, f.o.b. St. Louis, lb.		.07¼@	.07¾
Titanox C, f.o.b. St. Louis, lb.		.07¾@	.08¼

Zinc Oxide—American Process

American Azo: ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.06⅞
Horsehead Brand: Special	lb.	.07 @	.07½
XX Green	lb.	.07 @	.07½
XX Red, lead free	lb.	.06½@	.07
Kadox, black label	lb.	.10⅝@	.10⅞
blue label	lb.	.09⅝@	.09⅞
red label	lb.	.08 @	.08½

Zinc Oxide—French Process

White seal	lb.	.11⅝@	.11⅞
Green seal	lb.	.10⅝@	.10⅞
Red seal	lb.	.09⅝@	.09⅞

Yellows

Chrome	lb.	.17 @	.17½
Ocher, French medium	lb.	.02 @	.03
domestic	lb.	.01⅝@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.07½@	.07¾
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—

Blacks

Arrow "Aerfloted"	lb.	.05½@	.11
Bone Black	lb.	.07 @	.08½
Carbon, compressed	lb.	.05 @	.10
Carbon, uncompressed	lb.	.05 @	.10
Disperso, f.o.b. Louisiana	lb.	.051 @	—
Disperso, f.o.b. Texas	lb.	.05 @	—
Drop Black	lb.	.06 @	.14
Fumonex	lb.	.04½@	.08
Excello, compressed	lb.	.05 @	.09
Gastex, f.o.b. Texas	lb.	.04¼@	.05½
Lamp Black	lb.	.10 @	.40
Micronex	lb.	.05½@	.11
Thermatomic-Thermax	lb.		
Flex	lb.		
P-33	lb.		
United carbon, fob Tex.	lb.	.05½@	.11
Velvetex carbon	lb.	.04 @	.06
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Clay, China, domestic	ton	8.00 @	9.00
Aerfloted Suprex	ton	16.00 @	22.00
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Mineral Flour, c. l. fob mine	ton	20.00 @	23.00
Par	ton		
Tensulite		15.00 @	—
Glues, extra white	lb.	.22 @	.26
medium white	lb.	.20 @	.24
Magnesia, carbonate	lb.	08¾@	.11
Mica, white water grnd.	lb.	.06 @	.08
Off color (biotite)	lb.	.05 @	.07
Rotten Stone powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.72 @	4.02
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	— @	1.00
English cliffstone	cwt.	1.75 @	2.00
Quaker	ton		
Superfine	ton	10.00 @	12.00
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09¼@	.10½
Zinc Stearate	lb.	.23½@	.25

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Paradura	ton	62.50 @	65.00
Pioneer, MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	35.00 @	80.00

SOFTENERS

Acids

Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66°	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	.35 @	.33½

Acids, Fatty

Laurex	lb.	.15 @	.16
Stearex	lb.	.15 @	.19
Stearic, double pressed	lb.	.17 @	.22

Alkalies

Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.40 @	

Oils

Corn, refined, bbls.	lb.	.09 @	.10¼
Cottonseed, crude		— @	.07½
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c. l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04¼
Fluxrite	lb.	.05½@	.06½
Palm Lagos	lb.	.07⅝@	.07½
Niger	lb.	.06½@	.07
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08¼
Pigmentaroil	gal.	.21 @	.26
Pine, steam distilled	gal.	.65 @	.70
destructively distilled	gal.	.55 @	.58
Witco Palm Oil	lb.	.11 @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—

Resins and Pitches

Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	9.00 @	10.00
Rosin, grade K, 280 lb.	bbl.	— @	8.65
Pigmentar	lb.	.038 @	.0446
Tar Retort, 50 gal.	bbl.	13.50 @	15.00

Solvents

Acetone, pure	lb.	.11 @	.12
Alcohol denatured, No. 1 bbls.	gal.	.51 @	—
Benzol, 90%	gal.	.22 @	.24
Carbon bisulphide	lb.	.05½@	.06¼
Carbon tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naptha, solvent	gal.	.35 @	.40
Rub-Sol (f.o.b .Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.55 @	.61¼
wood	gal.	— @	.51
destructively distilled	gal.	.40 @	.43

Waxes

Beeswax, white	lb.	.51 @	.53
Carnauba	lb.	— @	.35
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30

Paraffin (c. l.—f.o.b. N. Y.)

Yellow crude scale	lb.	.03⅛@	—
White crude scale 124/126	lb.	.03⅛@	—
Refined, 125/127	lb.	.04¼@	—
Refined, 128/130	lb.	.04½@	—
Refined, 135/137	lb.	.05¾@	—
Refined, 138/140	lb.	.07¾@	—

ANTI-OXIDANTS

Agerite, Resin	lb.		
Powder	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	68 @	80
Resistox	lb.	54 @	57
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	55 @	68

SPECIALTIES

Sunproof	lb.	.35 @	.37½
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.09 @	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04½
Sulfur flour, Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags)	cwt.	1.75 @	2.10
Vandex	lb.		

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

THAT net imports during the past month once again exceeded domestic consumption seems apparent from present indications. Net imports of crude rubber were approximately 40,000 long tons, while absorption by American factories was considerably under that figure. Stocks in this country as of March 31 will, therefore, show another rise to new high levels.

Meanwhile, stocks of crude rubber in other parts of the world have been rising steadily, and it is probable that, if holdings on estates and in various ports and manufacturing centres not generally tabulated were included, total visible supplies would be in the neighborhood of 400,000 long tons. British stocks again advanced to new high levels, the combined London and Liverpool inventories on March 29 being 90,431 long tons as against 85,076 long tons on March 1.

The amount of crude rubber invoiced to the United States has shown a decline during the past few weeks, however, and in the four weeks ended March 29 totaled only 36,815 long tons as compared with 48,291 long tons in the four weeks ended March 1. There has been a drop in Malayan shipments, but exports of rubber from the Dutch East Indies show an increase.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,848,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,888	505,317,807	54.63	17,671	23,470,583	56.77	396,667
1927	426,258	339,874,774	35.60	27,775	24,715,488	39.76	398,483
1928	499,731	244,854,978	25.08	92,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1927:							
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	75.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,67[illegible]
Nov.	28,592	27,395,428	31.69	2,469	2,014,196	36.43	26,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,167	30,278,444	34.56	1,988	1,734,990	35.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,835	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	23,872,943	17.74	2,663	1,773,401	21.61	55,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,330,905	17.98	4,218	2,094,037	22.16	46,386
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,855,511	21.25	2,836	1,349,690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,282,217	20.80	34,578
Sept.	34,472	15,214,485	19.70	2,011	861,068	19.11	32,461
Oct.	38,163	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66	2,929	1,300,354	19.82	40,578
Dec.	42,952	17,572,330	18.27	2,745	1,007,279	16.38	40,207
1930:							
Jan.	47,496	17,793,563	16.72	3,144	1,077,415	15.30	44,352
Feb.	42,687	14,798,240	15.48	2,280	960,790	18.80	40,407
Mar.							
Apr.							
May							
June							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1923	1924	1925	1926	1927	1928	1929	1930
Jan.	30,106	29,058	29,638	32,196	31,518	34,403	43,002	36,669
Feb.	30,149	25,736	29,761	31,136	30,137	33,702	41,594	32,726
Mar.	36,629	28,385	33,498	32,936	36,141	35,688	44,780	
Apr.	29,085	27,129	34,139	32,696	35,871	32,772	47,521	
May	36,155	25,845	35,322	29,864	34,592	37,333	49,233	
June	24,272	22,753	35,822	28,593	33,801	37,676	43,227	
July	17,685	23,396	36,053	27,577	29,219	37,407	41,526	
Aug.	20,359	28,982	35,909	34,533	33,460	42,927	38,274	
Sept.	17,594	31,497	31,691	32,904	27,214	39,882	34,707	
Oct.	21,321	31,520	29,047	29,836	26,790	40,857	34,800	
Nov.	20,437	27,289	28,853	28,080	26,792	37,461	27,659	
Dec.	31,902	27,199	28,748	26,293	25,492	31,232	23,531	
Totals	305,694	328,769	388,481	366,149	371,027	441,340	469,804	

Figures on Quarterly Basis

Quarter	1922	1923	1924	1925	1926	1927	1928	1929
Jan./Mar.		96,776	87,609	95,263	94,301	99,216	103,558	128,565
Apr./June	127,360	89,493	75,674	104,099	87,109	103,242	103,500	139,292
July/Sept.		55,621	83,813	99,493	93,793	89,210	117,573	113,746
Oct./Dec.	155,067	63,617	92,656	85,789	83,212	80,860	117,597	84,872
Totals	282,427	305,507	339,752	384,644	358,415	372,528	442,227	466,475

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
Jan. 4	8,067	1,587	2,419	251	12,124
Jan. 11	7,235	931	1,469	15	9,650
Jan. 18	7,009	898	1,560	49	9,516
Jan. 25	9,212	1,103	2,051	14	12,380
Feb. 1	5,078	1,213	1,679	98	8,068
Feb. 8	9,902	1,788	2,572	31	14,293
Feb. 15	7,223	1,312	1,315	59	9,909
Feb. 22	7,010	1,223	2,389	51	10,673
Mar. 1	8,146	2,315	2,898	57	13,416
Mar. 8	6,637	925	1,990	45	9,597
Mar. 15	6,256	658	1,786	10	8,710
Mar. 22	7,075	753	1,997	19	9,844
Mar. 29	5,867	1,335	1,462	—	8,664

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1927																																
Oct.	22⅝	—	23¼	23⅝	23⅝	23⅝	23⅝	—	—	—	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	25⅛	—	—	24⅛
Nov.	25	25⅛	25⅛	25⅛	25⅛	—	—	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	—	25⅝
Dec.	40⅛	40¼	40¼	—	40¼	40¼	—	40½	40½	—	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½
1928																																
January	—	41¼	41¼	41¼	41¼	41	41	—	40¾	40½	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼
February	87½	87¾	87¾	—	—	36¾	—	—	—	—	36¾	—	—	34¾	34¾	—	—	—	—	33½	34¾	35	35	34¾	35	35	35	35	35	35	35	35
March	29	28¾	28¾	29	28¾	26¾	25½	—	—	—	—	—	—	—	25	—	—	—	28¾	26¾	26	26	26	26	26	26	26	26	26	26	26	26
April	17½	17¾	18¼	21¼	21¼	—	—	—	—	—	—	—	—	—	—	—	—	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾
May	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾
June	—	18¾	18¾	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
July	—	19¾	18¾	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
August	19½	19½	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾	19¾
September	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
October	18¾	18¼	18½	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾
November	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾
December	17¾	—	17¾	17¾	17¾	18¼	18¼	18¼	—	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼
1929																																
January	—	22¾	22	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	20	20	19¾	20	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼
February	22¾	22	22	21¾	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾
March	26	23¼	22¼	26	26	22½	25¾	25¾	25¾	25¾	25¾	25¾	25¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾
April	23	22¼	22¼	22¼	22¼	22½	22¾	22¾	22¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
May	19%	19%	19%	19%	19%	20¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
June	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
July	20¾	21¾	21¾	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Aug.	21¾	21¾	21¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾
Sept.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oct.	19¾	19½	19½	19½	19½	19½	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾
Nov.	17¾	17¾	—	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾
Dec.	16¾	16¾	16¾	16¾	16¾	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼
1930																																
January	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾
February	15¾	—	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾
March	15⅝	—	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝
April	15½	15½	15½	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	—	15¾

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	14.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14	15.24
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97	15.85
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55	15.34
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18	——
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46	——
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64	——
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30	——
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.59	——
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37	——
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	19.67	——
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62	——
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12	——
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55	——

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Jan.	Feb.	Mar.	Apr.	Day	Jan.	Feb.	Mar.	Apr.
1	—	7⅝	7⅞	7⅝	17	7⅝	8	7½	—
2	7⅞	—	—	7⅝	18	7⅝	8⅛	7½	—
3	7¾	7½	7⅞	7⅝	19	—	8⅛	7½	—
4	7¾	7½	7¾	7½	20	7⅝	8¼	7⅝	—
5	—	7½	7⅝	—	21	7⅝	8¼	7⅝	—
6	7¾	7⅝	7½	—	22	7⅝	8⅜	7⅝	—
7	7⅝	7¾	7½	—	23	7⅝	—	—	—
8	7⅝	7⅞	7⅝	—	24	7½	8⅛	7⅝	—
9	7⅝	—	—	—	25	7½	8⅛	7¾	—
10	7⅛	7⅞	7⅝	—	26	—	8⅛	7⅝	—
11	7	7⅞	7½	—	27	7½	7⅞	7⅝	—
12	—	8	7½	—	28	7½	7⅞	7¾	—
13	7¼	8	7½	—	29	7½	—	7¾	—
14	7¼	8	7¼	—	30	7½	—	—	—
15	7¼	8	7⅜	—	31	7½	—	7⅝	—
16	7½	—	—	—					

Average Monthly Price Per Pound

Month	1928 Pence	1929 Pence	1930 Pence	Month	1928 Pence	1929 Pence	1930 Pence
Jan.	19.310	9.942	7.471	Aug.	9.300	10.505	——
Feb.	15.713	11.875	7.948	Sept.	8.530	10.160	——
Mar.	12.736	12.135	7.595	Oct.	8.807	9.620	——
Apr.	8.864	10.490	——	Nov.	8.596	8.442	——
May	8.845	10.717	——	Dec.	8.570	7.958	——
June	9.293	10.580	——	Average for Year	10.656	10.291	——
July	9.312	11.065	——				

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Mar.	Apr.	Day of Month	Mar.	Apr.	Day of Month	Mar.	Apr.
1	15.10	16.65	11	14.30	——	21	15.85	——
2	——	16.55	12	14.55	——	22	15.95	——
3	15.00	16.80	13	14.50	——	23	——	——
4	14.90	16.60	14	14.70	——	24	15.70	——
5	14.60	——	15	14.85	——	25	15.80	——
6	14.50	——	16	——	——	26	16.00	——
7	14.15	——	17	15.05	——	27	16.00	——
8	14.05	——	18	15.55	——	28	16.00	——
9	——	——	19	15.45	——	29	15.80	——
10	14.00	——	20	15.50	——	30	——	——
						31	16.10	——

Average Monthly Price Per Pound

Month	1928 Cents	1929 Cents	1930 Cents	Month	1928 Cents	1929 Cents	1930 Cents
Jan.	19.12	20.22	17.21	Aug.	19.28	18.62	——
Feb.	18.40	20.21	15.62	Sept.	18.67	18.83	——
Mar.	19.38	20.19	15.13	Oct.	19.62	18.46	——
Apr.	20.63	20.29	——	Nov.	19.84	17.53	——
May	21.58	19.41	——	Dec.	20.22	17.28	——
June	21.50	18.74	——	Average for Year	19.97	19.03	——
July	21.36	18.62	——				

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1928	1929	1930	1928	1929	1930	1928	1929	1930
Jan.	110,244	76,342	120,649	41,256	78,596	61,863	151,500	154,938	182,512
Feb.	108,955	90,058	131,748	43,316	63,825	63,404	152,271	153,883	195,152
March	114,061	100,536		39,324	56,476		153,385	157,012	
April	113,083	107,659		33,986	55,409		147,069	163,068	
May	105,356	97,192		34,374	55,404		139,730	152,596	
June	90,198	92,061		40,001	46,035		130,119	138,096	
July	83,242	92,535		42,304	38,858		125,546	134,393	
Aug.	68,994	90,769		51,875	41,618		120,869	132,387	
Sept.	68,851	84,362		48,566	49,480		117,417	133,842	
Oct.	66,421	88,483		41,571	62,294		107,992	150,777	
Nov.	61,956	92,219		68,119	62,358		130,075	154,577	
Dec.	66,166	105,138		68,764	62,389		134,930	167,527	

(Rubber Manufacturers' Association figures raised to 100%.)

Stock of Crude Rubber in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1927	1928	1929	At end of	1927	1928	1929
Jan.	54,994	66,524	25,191	July	63,717	35,429	30,080
Feb.	58,826	62,964	25,554	Aug.	64,491	32,084	35,605
Mar.	63,055	58,272	28,214	Sept.	68,236	31,440	42,188
Apr.	66,897	53,425	31,368	Oct.	69,569	24,207	47,803
May	67,169	44,628	31,290	Nov.	67,050	17,775	52,454
June	63,902	38,756	31,025	Dec.	63,798	19,815	54,304

At End of Recent Weeks

Stocks in London

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1929					
May	31,580	31,127	30,955	30,893	
June	31,539	31,635	31,127	30,617	30,952
July	29,996	30,661	30,790	30,167	
August	30,937	31,444	33,573	34,651	35,605
September	36,620	37,901	40,151	42,077	
October	43,478	44,339	45,711	46,819	
November	48,092	49,302	50,068	51,012	52,538
December	53,431	53,180	53,894	54,260	
1930					
January	56,616	58,990	59,607	59,984	
February	60,460	61,482	62,659	62,725	
March	64,383	66,418	66,885	68,404	69,233

Stocks in Liverpool

1929					
May	4,614	4,384	4,216	4,665	
June	4,642	4,750	4,733	4,515	4,628
July	4,393	4,547	4,757	4,739	
August	4,662	4,481	5,993	7,285	7,560
September	8,351	8,660	9,780	10,161	
October	10,795	11,571	11,788	12,665	
November	14,272	16,158	17,543	17,479	17,752
December	17,922	18,263	18,696	19,059	
1930					
January	19,438	19,640	19,515	20,063	
February	19,898	19,761	19,677	19,704	
March	20,693	20,727	20,849	21,187	21,198

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1928	1929	1930	End of	1928	1929	1930
Jan.	25,868	29,617	37,123	July	18,663	33,859	—
Feb.	22,867	32,373	40,293	Aug.	18,971	30,834	—
Mar.	20,538	29,427	—	Sept.	14,898	32,138	—
Apr.	16,946	26,474	—	Oct.	12,149	33,770	—
May	17,437	30,764	—	Nov.	29,188	30,963	—
June	18,207	30,403	—	Dec.	32,895	35,548	—

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1926	24,199,524	78.8
1923	23,140,620	0.6	1927	19,700,008	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.8	1929	24,141,502	80.3
1929			1930		
July	1,896,666	78.2	January	1,601,326	84.0
August	1,570,099	79.4	February	1,653,421	78.9
September	2,110,003	80.7	March		
October	1,647,350	76.4	April		
November	596,989	64.7	May		
December	879,259	79.0	June		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1929	1930	MONTHS	1929	1930
January	22,602,000	25,731,000	July	36,860,000	
February	22,776,000	26,509,000	August	37,759,000	
March	28,495,000		September	34,133,000	
April	32,019,000		October	32,816,000	
May	34,117,000		November	31,502,000	
June	33,163,000		December	26,550,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944	73,308
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296	74,021
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624	12,627

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1928	1929	1930	1928	1929	1930	1928	1929	1930
Jan.	5,358	6,722	4,745	5,394	6,626	4,701	9,949	13,712	12,719
Feb.	6,363	6,912	—	5,031	5,282	—	11,721	15,495	—
Mar.	6,819	7,519	—	5,731	6,708	—	12,389	16,351	—
Apr.	6,178	7,884	—	5,812	7,294	—	12,717	16,929	—
May	6,759	8,145	—	6,457	7,184	—	13,024	17,849	—
June	6,692	7,304	—	7,117	7,254	—	12,162	17,957	—
July	6,498	6,475	—	7,895	7,855	—	11,157	15,830	—
Aug.	7,469	5,806	—	8,403	7,845	—	10,034	14,226	—
Sept.	6,802	4,758	—	7,145	5,998	—	9,765	12,875	—
Oct.	7,326	4,919	—	5,717	4,960	—	11,520	12,845	—
Nov.	6,075	3,603	—	4,998	3,558	—	12,579	12,935	—
Dec.	5,605	3,261	—	4,591	3,346	—	13,624	12,627	—

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180	73,417
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127	75,298
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117	13,360

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1928	1929	1930	1928	1929	1930	1928	1929	1930
Jan.	5,441	6,517	4,914	6,072	7,242	5,181	12,982	15,386	13,551
Feb.	6,895	6,769	—	5,431	5,278	—	14,650	16,999	—
Mar.	6,231	7,466	—	5,731	6,737	—	15,573	17,750	—
Apr.	6,661	7,634	—	5,702	7,164	—	16,638	18,134	—
May	7,168	7,660	—	6,300	7,038	—	17,702	18,928	—
June	6,953	6,978	—	7,136	6,950	—	17,159	17,741	—
July	6,674	6,178	—	8,729	8,113	—	14,974	16,332	—
Aug.	8,343	5,846	—	9,350	8,183	—	13,931	14,157	—
Sept.	7,103	5,536	—	7,154	6,250	—	13,543	13,424	—
Oct.	6,929	5,310	—	5,662	5,001	—	15,285	13,656	—
Nov.	5,592	3,780	—	5,002	3,712	—	15,743	13,701	—
Dec.	5,184	3,716	—	4,858	3,631	—	16,117	13,660	—

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
July	390,445	337,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.	413,722	358,872	54,850	21,193	16,572	4,621	434,915
Oct.	397,096	339,976	57,120	18,536	13,016	5,520	415,632
Nov.	256,936	217,256	39,680	11,769	8,154	3,615	268,705
Dec.	283,135	205,144	77,991	9,425	6,734	2,691	292,560
TOTAL	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	25,584	5,703	497,371
March	584,733	513,266	69,559	40,621	32,833	7,788	625,354
April	620,656	535,679	81,977	41,901	34,392	7,509	662,557
May	603,969	516,055	86,596	31,559	25,129	6,430	635,528
June	545,252	453,956	91,296	21,492	16,511	4,981	566,744
July	500,331	427,213	73,118	17,461	13,600	3,861	517,792
Aug.	499,629	444,711	54,918	14,214	11,037	3,177	513,843
Sept.	415,332	365,651	49,681	13,817	10,710	3,107	429,149
Oct.	380,011	321,195	58,816	14,523	8,975	5,548	394,534
Nov.	217,570	170,928	46,642	9,424	7,137	2,287	226,994
Dec.	119,950	92,717	27,233	5,495	4,426	1,069	125,445
TOTAL	5,358,361	4,603,609	754,752	263,295	207,498	55,797	5,621,656
1930							
Jan.	273,089	235,099	37,990	10,388	8,856	1,532	283,477
Feb.	323,962	276,833	47,129	15,548	13,021	2,527	339,510
March							
April							
May							
June							

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[5]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[4]	Amazon Valley	All Other[4]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,787	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,550
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,987	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,696	653,794
1929	577,202	161,525	415,677	81,584	11,663	11,077	7,166	5,018	65,990	87,789	134,037	9,696	21,148	6,589	857,434
1928:															
Feb.	28,848	12,911	15,937	4,947	1,021	667	581	536	4,052	6,757	8,630	787	1,612	1,276	46,860
Mar.	27,879	10,508	17,371	3,683	775	645	581	269	3,999	5,825	9,690	700	2,750	1,211	47,499
Apr.	20,139	9,335	10,804	3,233	789	630	494	258	3,993	5,940	5,499	736	1,014	1,323	33,810
May	26,483	10,350	16,133	3,091	654	842	494	241	4,943	5,355	10,347	717	2,602	1,135	45,994
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,655	725	1,399	969	40,788
July	30,481	13,383	17,098	5,129	1,043	905	593	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,433	11,893	712	1,732	450	56,986
Sept.	29,769	11,239	18,530	4,675	457	933	594	447	4,956	6,536	9,863	969	1,614	494	50,073
Oct.	24,476	12,603	11,873	3,999	864	949	564	457	5,295	7,474	10,124	513	1,399	732	44,248
Nov.	68,135	10,436	57,699	8,005	1,048	772	564	425	4,950	7,902	7,805	943	1,790	623	92,526
Dec.	66,763	11,122	55,641	7,848	1,113	744	565	294	5,120	8,792	10,896	948	2,220	588	94,769
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	600	461	5,640	8,067	11,076	850	2,134	642	79,439
Feb.	47,926	12,103	35,823	7,064	1,117	955	600	495	6,572	7,511	10,384	807	2,104	529	73,982
Mar.	49,448	14,553	34,895	6,583	1,413	758	601	499	5,515	6,620	10,629	658	2,332	786	71,289
Apr.	49,816	11,414	38,402	5,097	727	747	548	306	5,997	6,645	11,321	673	1,950	569	72,982
May	43,960	15,593	28,367	5,723	800	966	548	453	6,264	6,961	13,487	1,059	1,922	733	67,233
June	40,398	14,344	26,054	5,568	1,122	1,061	547	422	5,582	6,693	11,270	757	1,898	548	61,017
July	46,454	15,071	31,383	5,457	974	1,247	641	462	6,422	7,192	13,995	575	1,457	543	70,348
Aug.	50,441	15,469	34,972	6,079	685	993	641	431	4,644	7,298	10,782	1,032	1,563	499	69,619
Sept.	53,484	12,392	41,092	7,993	384	832	640	406	4,708	7,517	10,149	655	1,566	504	76,446
Oct.	47,937	12,516	35,421	8,381	812	1,047	600*	485	4,697	8,295	10,512	893	1,606	445	73,194*
Nov.	46,279	11,204	35,075	6,660	1,065	668	600*	278	4,760	6,711	9,380	771	1,442	400*	67,810*
Dec.	48,513	13,451	35,062	8,683	900	930	600*	320	5,189	8,279	11,102	966	1,674	400*	74,105*
1930:															
Jan.	52,535	9,454	43,081	7,037	1,560	791		386	5,709	7,831	8,920	856	1,837		
Feb.												944	1,787		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927 and 1,437 in 1928. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included— such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons in 1925, 44 tons in 1926, 84 tons in 1927, and 1,489 tons in 1928. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ee)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,371
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	509	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,984	6,430	2,493	2,643	172	-3,807	1,778	589	567	395,888
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,846	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,315	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,649
1927	398,488	60,249	34,271	38,892	26,405	20,521	11,881	12,018	9,499	6,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,483	15,134	8,450	7,958	2,243	4,418	3,178	3,133	596,695
1928:															
Jan.	37,120	1,921	1,764	2,485	2,290	1,361	760	755	802	589	52	261	335	376	50,871
Feb.	30,926	3,143	2,526	2,984	2,553	1,245	437	783	616	599	98	307	296	297	46,813
Mar.	36,893	3,179	1,902	3,521	2,989	1,694	763	231	918	816	95	351	497	398	54,247
April	35,663	—2,280	2,204	2,719	1,988	2,354	1,114	1,820	832	575	280	339	304	189	48,901
May	28,660	—5,822	3,297	2,944	2,180	2,288	1,090	3,893	655	746	209	485	220	213	41,558
June	25,143	—3,031	3,597	2,968	2,186	2,102	984	4,111	348	743	133	346	251	182	40,063
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	334	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,586	2,943	3,711	1,049	98	766	696	141	527	250	318	59,346
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	689	537	544	31	337	252	222	46,938
Dec.	40,781	8,438	3,633	2,470	2,618	3,002	1,145	1,378	755	639	148	435	263	200	65,905
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	2,776	1,481	956	1,061	749	218	638	179	525	89,571
Feb.	41,881	5,179	5,001	4,613	2,998	2,727	1,259	684	1,131	627	113	226	115	356	86,275
Mar.	46,391	9,068	4,409	4,586	4,961	2,630	1,515	716	725	931	316	354	80	409	77,091
Apr.	32,447	8,295	4,854	5,351	3,177	2,808	1,407	703	1,518	750	144	956	40	445	82,395
May	43,350	5,112	3,152	3,682	2,937	2,814	1,417	996	1,437	854	201	468	37	277	71,223
June	38,676	4,787	6,814	3,948	3,075	1,593	1,624	695	2,215	672	687	507	24	420	65,787
July	40,914	4,993	4,839	3,559	3,205	2,388	2,023	1,056	2,918	1,039	253	519	30	465	68,801
Aug.	35,207	14,594	4,645	4,082	2,879	3,663	908	700*	724	902	254	429	25	319	69,331*
Sept.	32,171	17,010	3,889	4,691	1,908	3,511	1,224	700*	853	672	253	361	91	477	67,811*
Oct.	35,840	16,111	4,489	3,355	1,821	3,902	1,338	700*	1,125	1,147	278	710	91	201	71,608*
Nov.	40,972	13,141	3,082	3,776	2,709	3,221	1,275	700*	1,453	361	253	595	62	280	71,880*
Dec.	40,488	12,484	4,274	2,921	2,114	2,251	1,198	700*	726	741	52	677			
Jan.	44,759	11,106		3,862	2,842		910								

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926; to 5,010 tons in 1927; to 3,076 in 1928; and to 1,231 tons in 1929. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics Yards	Rubber Heels Pairs	Rubber Soles Pairs	Mechanical Goods Shipments Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,212,000	12,258,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	27,645,000	69,114,000
1929	50,731,000	232,126,000	34,499,000	74,770,000
1928:				
January	2,177,000	17,682,000	3,431,000	$5,630,000
February	2,575,000	19,181,000	3,628,000	5,338,000
March	3,353,000	22,583,000	3,747,000	6,675,000
April	2,416,000	18,575,000	2,928,000	5,406,000
May	2,744,000	21,597,000	3,519,000	6,274,000
June	2,962,000	18,768,000	3,321,000	6,126,000
July	3,447,000	17,630,000	3,168,000	5,157,000
August	4,613,000	21,289,000	3,461,000	6,306,000
September	4,966,000	21,451,000	2,725,000	5,393,000
October	5,914,000	21,932,000	2,297,000	5,837,000
November	4,173,000	18,686,000	2,649,000	5,201,000
December	2,348,000	15,211,000	2,771,000	5,271,000
1929:				
January	2,823,000	19,915,000	3,276,000	6,033,000
February	3,095,000	18,979,000	2,869,000	6,135,000
March	3,952,000	17,226,000	2,746,000	7,013,000
April	4,000,000	17,256,000	2,601,000	7,035,000
May	4,860,000	19,541,000	2,916,000	7,189,000
June	4,409,000	20,007,000	2,502,000	6,792,000
July	4,260,000	19,315,000	1,295,000	6,306,000
August	5,085,000	23,095,000	2,948,000	6,792,000
September	5,507,000	21,702,000	2,841,000	5,906,000
October	6,116,000	22,386,000	3,502,000	5,887,000
November	4,395,000	17,863,000	3,400,000	4,932,000
December	2,291,000	14,781,000	3,003,000	4,751,000

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	987,088	8,332	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	53	26,945	814	1,077,859	1,745	351,393	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,154	542,227	700	898,524	4,565	953,308	912	376,167
1924	1,356	636,892	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,751	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,805	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	1,597	777,128
1929	1,231	545,175	728	566,964	8,203	2,458,126	447	167,479
1929:								
July	200	86,175	49	46,440	572	180,065	14	5,807
Aug	190	80,443	58	47,769	575	171,733	—	—
Sept.	107	51,156	38	30,327	913	279,225	—	—
Oct.	200	79,968	58	43,756	636	181,421	—	—
Nov.	125	47,796	13	11,600	583	182,677	49	14,935
Dec.	100	41,328	25	19,955	550	156,939	51	12,095
1930:								
Jan.	150	55,272	28	28,549	509	141,384	—	—
Feb.	75	25,956	52	45,319	367	93,087	—	—

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Consumption Production	Consumption Tons	Consumption % to Crude	Stocks*	Year	Consumption Production	Consumption Tons	Consumption % to Crude	Stocks*
1920	96,395	75,297	38.4	.....	1925	132,930	137,105	35.6	13,203
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	228,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1928:									
Jan.	14,862	20,140	58.5	21,941	July	17,278	19,070	51.0	17,305
Feb.	15,291	18,670	55.4	20,848	Aug.	19,049	17,890	41.7	15,881
Mar.	17,069	20,680	57.9	19,558	Sept.	18,693	17,795	44.6	17,991
Apr.	15,393	19,280	58.8	19,283	Oct.	17,182	18,420	45.1	17,026
May	18,945	20,215	54.1	18,187	Nov.	18,245	18,380	49.1	22,399
June	18,781	18,140	48.2	18,709	Dec.	17,728	14,320	45.9	24,785
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,236	48.7	19,679
Feb.	18,094	19,829	47.7	23,805	Aug.	19,787	18,230	47.6	22,309
Mar.	19,984	20,867	46.7	22,076	Sept.	18,660	17,071	49.2	24,984
Apr.	19,899	22,455	47.3	20,680	Oct.	18,865	18,744	53.8	25,117
May	20,385	23,176	47.1	19,479	Nov.	14,363	15,330	55.4	26,080
June	18,416	18,141	42.0	17,980	Dec.	13,429	11,581	49.0	27,464
1930:									
Jan.	15,010	17,454	47.6	24,241	July	.....	.....	.....	.....
Feb.	15,846	14,559	44.5	24,243	Aug.	.....	.....	.....	.....
Mar.	.....	.....	.....	.....	Sept.	.....	.....	.....	.....
Apr.	.....	.....	.....	.....	Oct.	.....	.....	.....	.....
May	.....	.....	.....	.....	Nov.	.....	.....	.....	.....
June	.....	.....	.....	.....	Dec.	.....	.....	.....	.....

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,869 tons in 1929.

REVIEW DESK

Books, New Publications, Catalogues, Etc.

HANDBUCH DER KAUTSCHUKWISSENSCHAFT. Edited by Professor K. Memmler. Published by S. Hirzel, 2 Konigstrasse, Leipzig, Germany. 1930. 792 pp. 60 marks.

The product of eight distinguished German technologists, assembled by Professor Memmler, director of the State Bureau for Testing Materials, this volume is an encyclopedic review of the entire science of rubber. A historical introduction is followed by seven comprehensive chapters on the botany and growth of rubber, the chemistry of rubber, the problems of vulcanization, chemical analytical methods, the physics of rubber, mechanical testing practices, and the microscopy of vulcanization. All latest developments in rubber technology are included, and the work is clarified by 246 illustrations, including 10 plates in black and colors.

LES PROGRES DE LA TECHNOLOGIE DU CAOUTCHOUC. By Dr. Kirchhoff. Published by the Librairie Technique Beranger, Paris, France. 1930. 220 pp. 55 fran.

Dr. Kirchhoff's treatise is already established as an authority in the field, and this translation of the work into French by W. Demarche and A. Andrien should be of great value to the rubber technologists of France and Belgium. The volume is illustrated with 66 photographs and drawings and with numerous tables throughout the text.

STANDARDS YEARBOOK, 1930. Published by the National Bureau of Standards, United States Department of Commerce, Washington, D. C. 1930. 306 pp. $.75.

A summary of the more important research work done by the Bureau of Standards during the past year is to be found in this annual report. Industrial research accomplished by the bureau included abrasion tests for rubber, a survey of the manufacture of sponge rubber, a report on the properties of rubber floor tile, a study of the deterioration of rubber compounds with oxygen bomb tests, and an investigation of the effects of humidity and temperature upon the stress-strain relation and upon the abrasion resistance of rubber. The Rubber Division of the American Chemical Society co-operated with the bureau and has furnished a research associate to work at the bureau.

FINANCIAL DEVELOPMENTS IN THE FAR EAST DURING 1929. By Herbert M. Bratter. Published by the Government Printing Office, Washington, D. C. 1930. $.10.

Last year was a difficult one from a financial standpoint for several Oriental countries, while in others financial reforms were introduced or forecast. Silver-using nations felt keenly the decline in the price of silver, and the repercussion from all these factors was evident in the commercial field. The information presented in this Department of Commerce survey has in almost all cases been obtained from first-hand reports and covers China, Japan, British India, Dutch East Indies, Australia and New Zealand.

PIGMENTAR. Published by E. W. Colledge, 300 Madison Avenue, New York City. 1930. 24 pp. For free distribution.

Second only to stearic acid, pine tar is an ingredient used in almost every automobile tire produced. The development of Pigmentar resulted from a group of pine tar producers co-operating through a single sales centre to control the uniformity of their product by operating under identical conditions. The data in this pamphlet, compiled and condensed in as concise a manner as possible, are based on study and tests conducted over a period of more than a year by M. Omansky, with the co-operation of the E. W. Colledge laboratory. The effect of Pigmentar on various types of rubber compounds is described in full, with the results of tests tabulated.

CERTIFICATION PLAN SIGNIFICANCE AND SCOPE. Published by the Bureau of Standards, United States Department of Commerce, Washington, D. C. 1930. 16 pp. For free distribution.

The so-called "certification plan" involves the compilation and distribution of lists of manufacturers desirous of obtaining contracts based upon certain selected nationally recognized specifications, and willing, when requested to do so, to certify to the purchaser that the commodities delivered are guaranteed to comply with the requirements and tests of the specifications. The aims and objects of the plan, the attitude of consumer groups, trade associations and technical societies, its benefits and economies, are described in this leaflet.